Ontario

ONTARIO GEOLOGICAL SURVEY

Open File Report 6052

Report of Activities, 2000
Resident Geologist Program

Southern Ontario Regional Resident Geologist Report:
Southeastern and Southwestern Districts,
Mines and Minerals Information Centre and
Petroleum Resources Centre

by

P.J. Sangster, W.J. McGuinty, V.C. Papertzian, K.G. Steele, C.R. Lee, D.A. Laidlaw, T.R. Carter, G.J. Spears, R. Debicki and D. Rowell

2001

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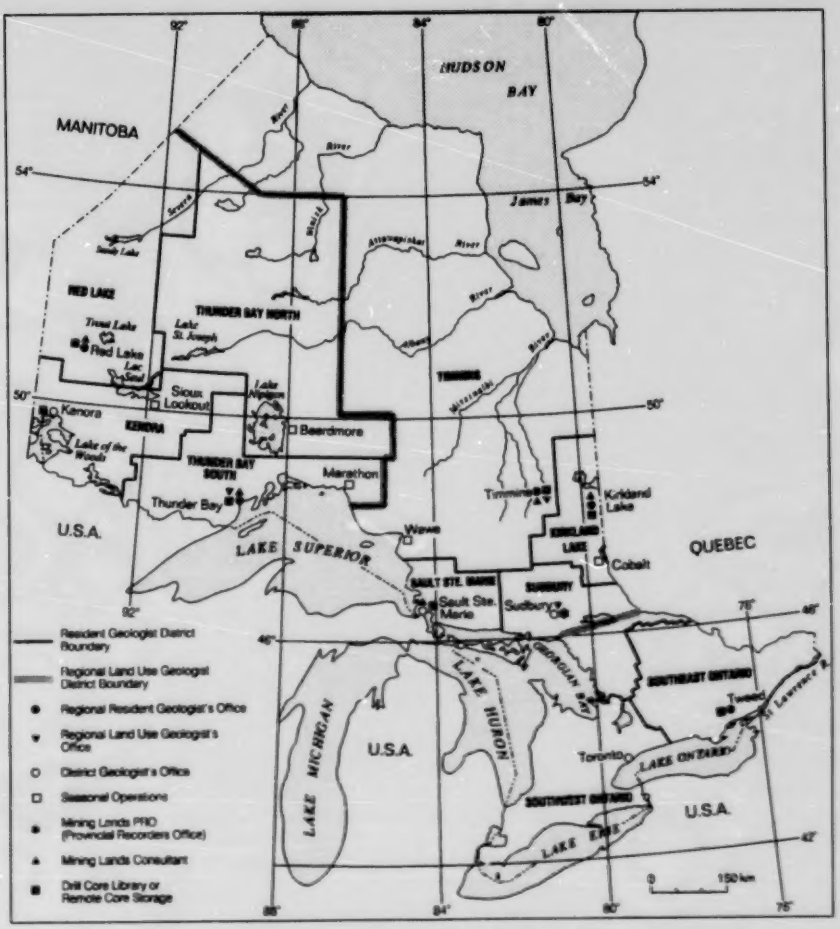

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ONTARIO GEOLOGICAL SURVEY

RESIDENT GEOLOGIST PROGRAM

REPORT OF ACTIVITIES – 2000

SOUTHERN ONTARIO
REGIONAL RESIDENT GEOLOGIST REPORT

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Ontario

Ontario Geological Survey
Regional Resident Geologist Program

Southern Ontario Regional Resident Geologist--2000
(Southeast District)

by

P.J. Sangster, V.C. Papertzian and D.A. Laidlaw

2001

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Southern Ontario Regional Resident Geologist (Southeast)--2000

P.J. Sangster[1], V.C. Papertzian[2] and D.A. Laidlaw[3]

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INTRODUCTION

In 2000, the District saw continued production from mines and quarries both in the Grenville Province and in the Paleozoic rocks to the south and to the east. OMYA Canada Inc. completed a multi-million dollar, five-year plant expansion program near Perth. Junior mining companies, independent prospectors and one major mining company completed exploration programs in the area. Claim staking activity increased by approximately 40% over the number of claims recorded during the previous year. The search for gold, base metals and industrial minerals dominated exploration activity. The evaluation of potential dimension stone deposits also maintained a high profile in the area.

MINING ACTIVITY

During 2000, there were 36 mining operations in southeastern Ontario including: 5 industrial mineral operations; 2 trap rock producers; 2 cement producer's quarries; 1 brick producer's quarry; 3 gemstone and mineral specimen quarries; 21 dimension and decorative stone producers and 1 producer of magnetite for use as heavy aggregate in nuclear shielding. For a complete listing of Mining Activity and locations of operating mines and mills in southeastern Ontario, please refer to Table 1 and Figure 1, respectively.

OMYA Canada Inc.

OMYA Canada Inc. is the leading producer of calcium carbonate products for industrial applications in Canada and the United States. In 2000, the company completed a five-year, multi-million dollar expansion program at their Perth plant and at the Tatlock Quarry. Calcium carbonate is globally the most used mineral filler in paint and plastics markets. OMYA supplies these markets with nearly 100 different grades of varying particle size dry product under the trade name "Snowhite". Dry calcium carbonate is shipped in bulk, SuperSacs or bags (25 kg). A wet product calcium carbonate is marketed under the trade name "Hydrocarb". Hydrocarb is produced as slurry and transported by railcar or tanker truck to markets in the United States and in Canada. Its main application is as a filler and coating in the pulp and paper industry. Lower grade ore is used as aggregate in the manufacture of white building block and as landscaping stone. (OMYA Canada Inc., personal communications, August 2000, January 2001)

ESSROC Canada Inc.

ESSROC Canada Inc., the Canadian operation of the Italcementi Group announced in July 2000 plans for a $50+ million expansion of its cement manufacturing facilities in Picton, Ontario. The expansion will take just over 1 year to complete after permitting is secured. Permits and applications will be submitted to the Ministry of the Environment and Energy (MOEE) and appropriate local authorities following project planning by the company.

The proposed expansion will increase production capacity at the Picton plant by 260 000 tonnes through upgrading the existing energy-efficient kiln. According to the Cement Association of Canada (CAC) cement industry projections, the total market demand in the areas served by the Picton facility is about 8 million tonnes. The expansion is designed to replace cement imports and to meet market growth expectations. The expansion will also incorporate many of the latest technologies to maximize environmental improvements, helping the company to prepare for proposed environmental regulations currently under consideration by the Ministry of the Environment and Energy (MOEE). Local contractors as well as industry specialist contractors will complete the construction. No new production jobs are anticipated.

The Picton facility was built by Lake Ontario Cement Co. in 1955 and was purchased in 1986 by Ciments Français. The company name was changed to ESSROC Canada Inc. in 1989. ESSROC employs 205 people at the Picton facility. The plant serves primarily Ontario and U.S. markets in Michigan, Ohio and New York states. ESSROC is the 6th largest cement producer in North America and its parent company, the Italcementi Group, is one of the largest cement producers in the world and also is among the world's largest producers of ready-mix concrete and aggregates. Consolidated sales of Italcementi Group in 1999 were in excess of $3 billion, of which ESSROC's net sales were approximately $550 million (Essroc Canada Inc., press release, August 2000).

Table 1. Mining Activity in 2000 – Southern Regional Resident Geologist (Southeast) (Keyed to Figure 1).

No.	Company/Individual (Mine Name)	Township (Commodity)	Mining Activity
1.	3 M Canada Inc. (Havelock Quarry)	Belmont (Trap Rock)	Roofing granules and HL-1 aggregate used in the production of premium asphalt mixes for Ontario highways, concrete, anti-skid treatment, bridge decks, railway ballast, asphalt shingles and rolled roofing;
2.	Allan Franks Construction Ltd.	Madoc (Limestone)	Limestone has been quarried and crushed since 1991 for road aggregate.
3.	Aqua Rose Quarries	Lyndoch (Gem Minerals)	Quarrying operations for rose quartz, beryl, feldspar, lyndochite, amazonite, cleavelandite, peristerite, columbite, fluorite and bertrandite. Two quarries are in operation: the Beryl Pit which charges a fee for mineral collecting and the Rose Quartz Quarry which produces landscape stone.
4.	Arriscraft Corporation (Elgin Quarry)	Bastard (Sandstone)	Potsdam sandstone was quarried for the manufacture of reconstituted sandstone. Raw material was shipped to Cambridge, ON, for processing. In 1998, a new application was found with blocks being quarried and cut into tiles for lining acid tanks.
5.	Bancroft Chamber of Commerce (Bear Lake Diggings)	Monmouth (Mineral Specimens)	Fee for collecting site near Wilberforce.
6.	Belmont Rose Granite Corp. (Belmont Rose Granite Quarry)	Belmont (Dimension Stone)	Granite is quarried for dimension stone, curb stone and landscaping purposes.

No.	Company/Individual (Mine Name)	Township (Commodity)	Mining Activity
7.	Canada Brick (Russell Quarry)	Russell, Gloucester (Clay Products)	Clay bricks are produced from red shale. During 2000, 74 883 tonnes of material were extracted. The quarry is located in Russell Twp. while the brick plant, located in Gloucester Twp. produced an estimated 42M brick units.
8.	Canada Talc Division, Highwood Resources Ltd., (Henderson Mine)	Huntingdon (Talc, Dolomite)	Highwood Resources Ltd., purchased Canada Talc in 1999. Highwood has invested considerable time and capital into upgrading and expanding facilities at both the mine and the processing plant. Additional access to ore has been attained by the development of a new mining level (underground) at the Madoc Mine which will allow for the planned increase in production to over 20 000 tonnes per year. Similarly, the completed upgrading and expansion of processing lines at the Marmora processing plant has allowed for the increased volume of ground and micronized talc and dolomite products as well as the processing of other mineral filler products, principally barite.
9.	Central Ontario Natural Stone (Batty Quarry)	Laxton (Limestone)	Grey, buff and black limestone is produced as flagstone.
10.	Central Ontario Natural Stone (Oxtongue Lake Quarry)	McClintock (Stone)	Pink and grey granite gneisses are quarried for flagstone, building stone, landscaping stone from 12 separate quarries, including a newly licensed operation at Bobcaygeon.
11.	Cornwall Gravel Company Ltd. (Cornwall Quarry)	Cornwall (Limestone)	Rough blocks of black limestone for dimension stone are produced on demand from the thick upper beds of this construction aggregate quarry.
12.	Danford Construction (Springbrook Road Quarry)	Huntingdon (Limestone)	Limestone is quarried and crushed for road aggregate (seasonal operation)
13.	Drain Construction	Dummer (Limestone)	Limestone for use as road aggregate.
14.	ESSROC Canada Inc. (Picton Quarry)	Sophiasburg (Cement)	A cement plant and on-site limestone quarry with an annual production of slightly less than 1 million tons. This is one of the largest cement plants in North America.
15.	Granimar Quarries Ltd.	Rear of Leeds and Lansdowne (Granite)	Approximately 10 000 cubic feet of granite was shipped from the stockpile at the quarry site. An additional 50 000 cubic feet of granite has been extracted from the quarry and is ready for shipping.
16.	I.K.O. Industries Ltd. (I.K.O. Quarry)	Madoc (Trap Rock)	Trap rock is quarried for roofing granules and HL-1 aggregate. An on-site mill and colouring plant have been in operation since 1998.
17.	International Quartz Ltd.	McClintock (Quartz)	Decorative and crushed white quartz and terrazzo.
18.	LaFarge Canada Inc. (Bath Quarry)	Ernestown (Cement)	A cement plant and on-site limestone quarry with a capacity to produce 1 million tonnes of cement. Silica used in the production of cement is extracted from the company's Potsdam sandstone quarry in Pittsburgh Twp. as well as from recycled foundry sands.
19.	Nelson Windover Quarries (Windover, Buckhorn Quarry)	Harvey (Limestone)	Grey limestone is quarried as a seasonal operation for the production of flagstone.
20.	North Hastings Aggregate Ltd.	Dungannon (Decorative Aggregate)	Multicoloured granite is extracted for use as decorative aggregate. 15 000 tons were shipped in 1999.*
21.	OMYA (Canada) Inc. (Tatlock Quarry)	Darling (Calcite)	Calcitic marble is mined to produce high purity, fine-grind calcite for fillers with terrazzo chips and landscaping stone as secondary products. Annual production is 250 000 tons and quarry reserves currently stand at over 5M tons. In 2000, a 5-year expansion program was completed at their quarry and plant located in Perth.
22.	Payne, E.W. (Payne Quarry)	Dummer (Limestone)	Flagstone is produced seasonally from this quarry. In 1999*, 1500 tonnes were quarried.
23.	Princess Sodalite Mine	Dungannon (Gemstones)	Rehabilitation of the site continues under new ownership. Limited samples were available for sale on site.

No.	Company/Individual (Mine Name)	Township (Commodity)	Mining Activity
24.	Redstone Quarries	Harvey (Limestone)	Red and green marble as well as grey limestone is quarried for flagstone, landscaping stone and armour stone.
25.	Rideauview Contractors Ltd. (Ellisville Quarry)	Rear Leeds & Lansdowne (Sandstone)	Sandstone is produced for landscaping material and limestone from Pettworth is also processed on site.
26.	Rideauview Contractors Ltd. (Pettworth & Renaud Quarries)	Camden (Limestone)	Limestone was quarried for building restoration work in Kingston.
27.	Rideauview Contractors Ltd. (Rideauview Quarry)	Storrington (Sandstone)	Red sandstone is produced for ashlar and flagstone.
28.	Rideauview Contractors Ltd. (Sloan Quarry, Battersea Quarry)	Storrington (Sandstone, Granite)	Cream and red sandstone is quarried for the production of ashlar, flagstone and landscaping stone at the Sloan Quarry. Red granite is quarried at the Battersea Quarry.
29.	Specialty Aggregate Corporation	Madoc (Marble)	Red, pink, white, green, buff, black, blue, chocolate, light buff and light green marble is quarried from 8 quarries in the Madoc area. Marble chips (terrazzo), exposed aggregate and landscape stone are produced at the mill. In 2000, 5000 tonnes were processed.
30.	Specialty Aggregate Corporation	South Canonto (Heavy Aggregate)	Magnetite is quarried and crushed on site for use as heavy aggregate in nuclear shielding. In 2000, approximately 23 000 tonnes were drilled and blasted and 900 tonnes were transported to the mill in Madoc.
31.	St. Lawrence Cement Inc. (Colborne Quarry)	Cramahe (Limestone, Cement)	1 987 516 tonnes of limestone were extracted from the quarry in 1999. *
32.	Stone Cottage Inn Ltd. (Attia Quarries)	Harvey (Limestone)	Grey limestone is quarried for dimension stone.
33.	The Kingston Red Granite Co. Ltd. (Seeley's Bay Quarry #1 & Seeley's Bay Quarry #2)	Rear of Leeds and Landsdowne (Granite)	Red granite is quarried for armour stone, landscaping, architectural and structural stone from both quarries. 18 000 tonnes were processed in 2000.
34.	Timminco Ltd. (Timminco Metals Quarry)	Ross (Magnesium, Strontium & Calcium metal)	Magnesium is produced from high-purity dolomite mined at this location. Calcium and strontium are produced from purchased limestone. Production rate is 1000 tons of dolomite weekly. The annual production is 6000 tons of magnesium metal and alloys; 400 tons of calcium metal and alloys and 135 tons of strontium metal. The operation employs 240 people and there are reserves for 50 years at the current rates of production.
35.	TRT Aggregates Ltd.	Ameliasburgh, Hilliard, Tyendinaga, Thurlow & Richmond (Limestone)	Rough dimension stone blocks, armour stone, flagstone and crushed limestone are produced. Most of the quarries are operated on an as-needed basis. Lafarge Canada acquired TRT at the end of 2000.
36.	Unimin Canada Ltd. (Blue Mountain Quarry)	Methuen (Nepheline Syenite)	Nepheline syenite is mined from a quarry and processed in 2 mills. Magnetite is produced as a bi-product. Production rate is 2500 tons per day. The mine opened in 1955 and employs 152 people.
37.	Upper Canada Stone Co. Ltd. (Cashel Quarry)	Cashel (Calcitic Marble)	White marble is quarried and sold as crushed marble, landscaping stone, decorative stone and in precast architectural concrete and panels.

**2000 figures not available at time of writing*

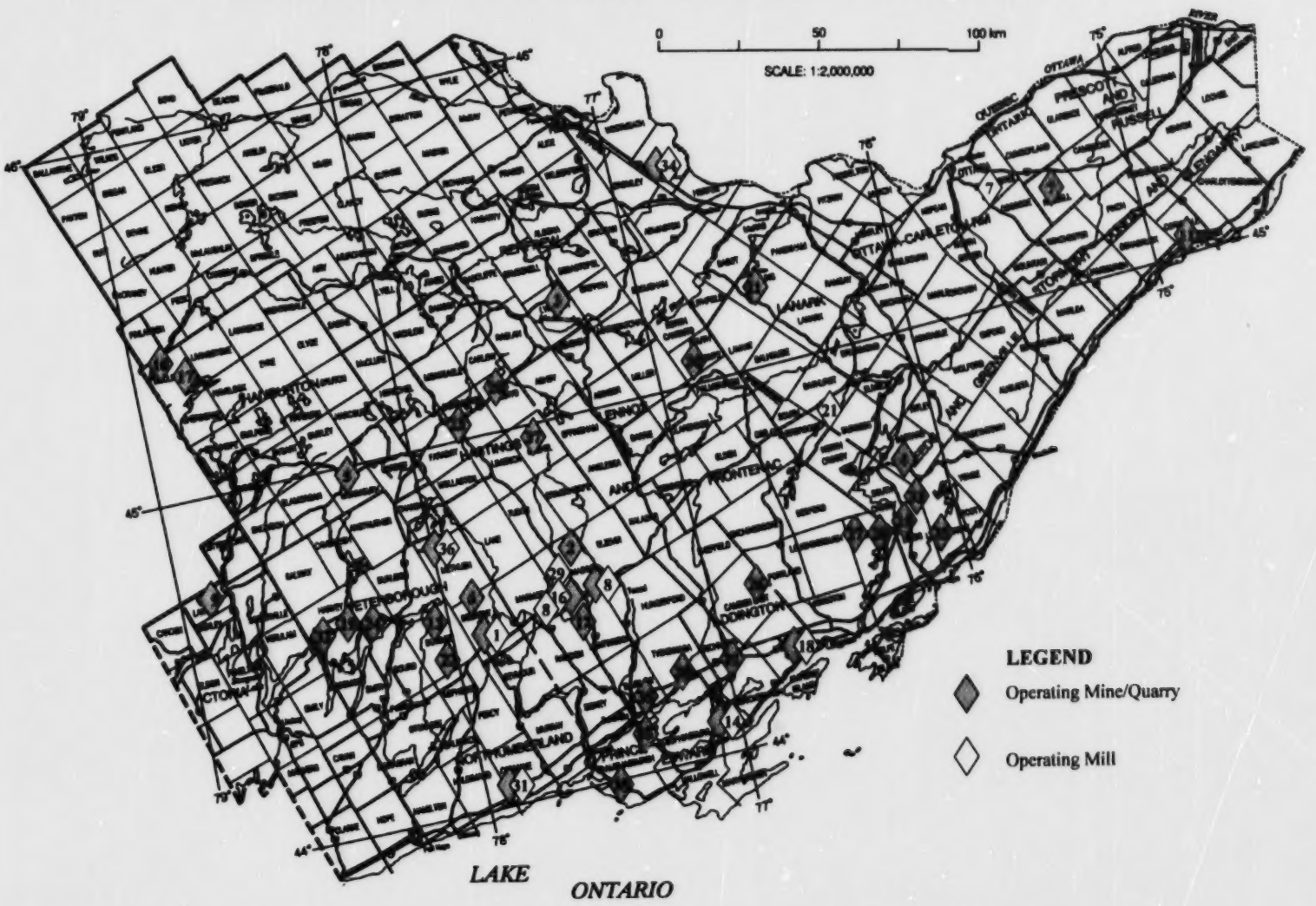

Figure 1. Mining/Quarrying Activity in 2000 - Southern Regional Resident Geologist Region (Southeast).

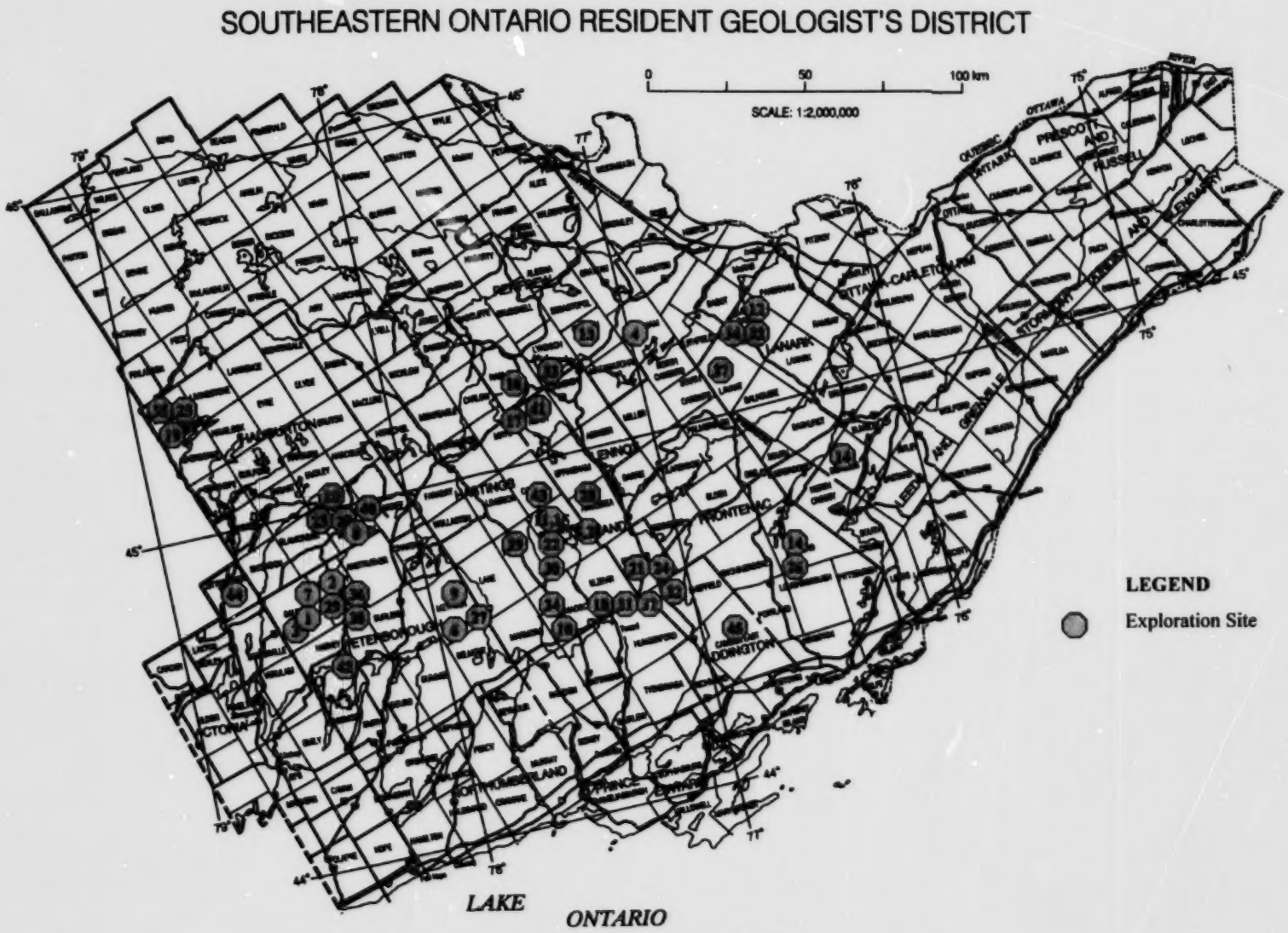

Figure 2. Exploration Activity in 2000 - Southern Regional Resident Geologist Region (Southeast).

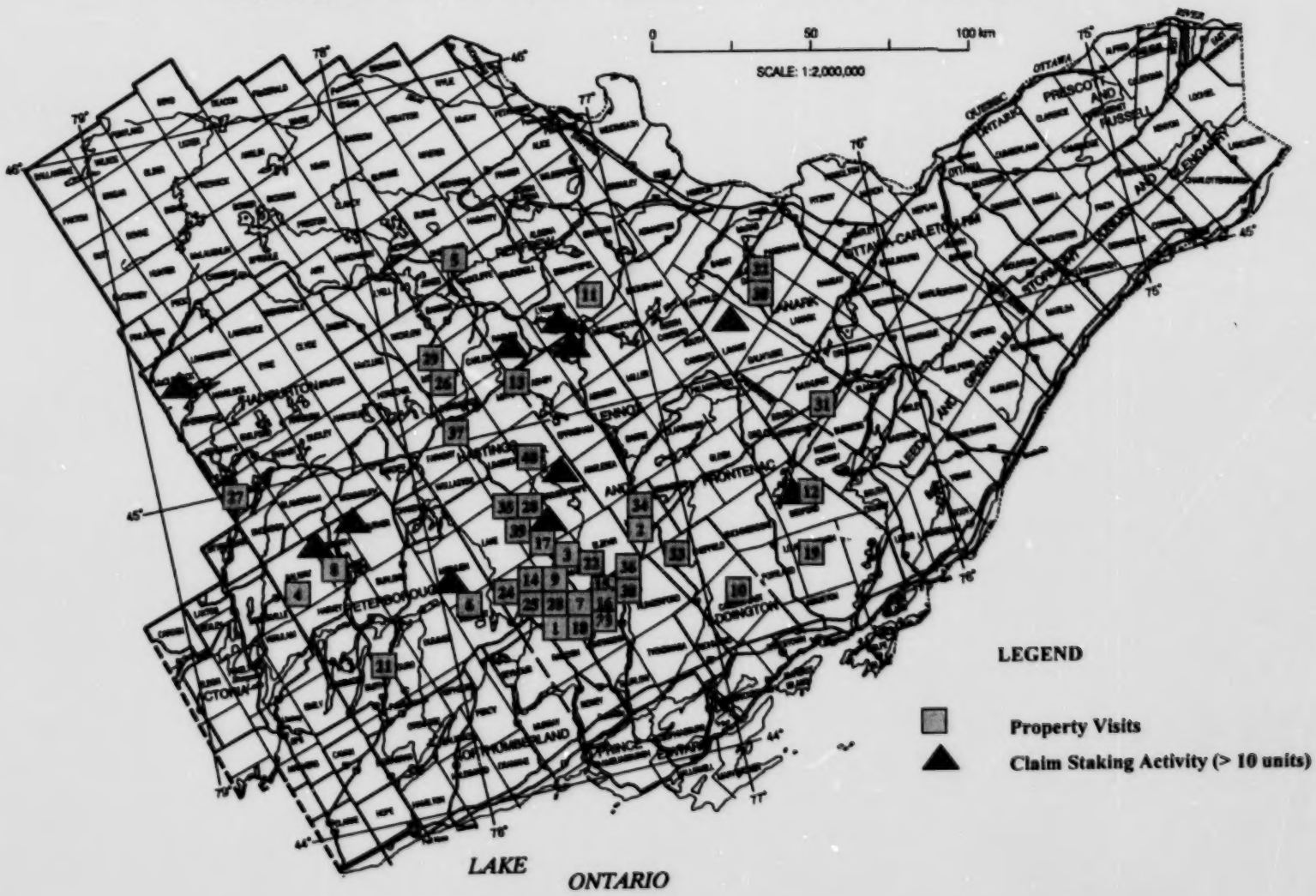

Figure 3. Property Visits and Claim Staking Activity in 2000 - Southern Regional Resident Geologist Region (Southeast).

Table 2. Summary of Staking Activity from 1993 to 2000 and Value of Assessment Work Completed from 1993 to 1996 – Southern Regional Resident Geologist (Southeast).

Year	Claims Units Recorded	Claim Units Cancelled	Claims Units Active	Diamond Drilling ($)	Physical Work ($)	Geotechnical* Work ($)	Total ($)
2000	762	N/A	N/A	N/A	N/A	N/A	N/A
1999	545	N/A	1 538	N/A	N/A	N/A	N/A
1998	269	N/A	1 588	N/A	N/A	N/A	N/A
1997	201	249	N/A	N/A	N/A	N/A	N/A
1996	748	251	1 304	19 767	99 434	212 178	331 379
1995	301	346	807	44 185	31 554	86 368	162 107
1994	229	417	852	763 545	115 052	135 168	1 013 765
1993	153	277	1 040	N/A	8 399	125 853	134 252

** As of 1992, Geological and Geophysical Survey data are combined as Geotechnical Work.*

ADVANCED EXPLORATION

Diamond Lake Minerals Inc. Graphite Deposit – Bedford Township

Diamond Lake Minerals continued evaluation of their graphite deposit in Bedford Township. Including ground staked and recorded in late 2000, the company now holds 97 unpatented mining claims in Bedford and Burgess townships. For further information, please see "Property Examinations".

Palu-Corbelli Corporation Granite Deposit - Sheffield Township

Results of a bulk-sampling program completed on the Palu-Corbelli Corporation granite dimension stone prospect in Sheffield Township were very positive. As of December 31, 2000, the company was awaiting response to an application for permitting under the Aggregate Resources Act to bring the quarry into production. A local cottagers' association has mounted a strong opposition to the quarry and has enlisted the help of high profile environmental protection organizations. The property is situated on unpatented mineral claims surrounded by an *Ontario's Living Legacy* proposed conservation reserve. (J. Palu, Palu-Corbelli Corporation, personal communication, December 2000).

Regis Resources Vermiculite Deposit – Cavendish Township

A summary of previous work on the Regis Resources Cavendish Township vermiculite deposit is given in 1998 and 1999 Report of Activities, Southern Regional Resident Geologist (Southeast). Although a portion of the property was fully permitted under the Aggregate Resources Act in 2000, an application has been made to expand the licensed area. Exploration of the deposit in 2000 included additional stripping, bedrock sampling, trenching, prospecting, exfoliation tests and claim staking of newly identified zone extensions. The company now holds over 300 unpatented mining claims in Cavendish and Galway townships. The company reports that vermiculite from most recent exploration is of a higher quality than earlier reported. Results of a feasibility study completed by A.C.A. Howe International Ltd. in 2000 were very positive and the company is in the process of arranging financing to build a mill. (D. Simmons, Ministry of Natural Resources, personal communication, January 2001; Regis Resources Ltd., assessment file report, 2000, Martin Shefski, Regis Resources Ltd., personal communication, February 8, 2001)

Bulk Sample Permits

Although only 20 non-metallic minerals are designated under the Mining Act, the process of bulk-sampling certain minerals that fall under the Aggregate Resources Act is administered under the Mining Act. Bulk samples of aggregate, crushed stone, dimension stone and other industrial minerals allow the developer to test product quality, markets and suitability for proposed applications. In 2000, Ontario 1262646 Inc. requested a permit to bulk sample a dolomitic marble prospect in Ashby Township.

EXPLORATION ACTIVITY

Robert Dillman Properties

Robert Dillman filed assessment work on his Raglan nickel property in southern Raglan Township. Commodities being sought include base metals and platinum group elements. The best assay result recorded to date on the property is 388 ppb combined platinum and palladium, 1.2% Cu and 0.93% Ni. (R. J. Dillman, personal communication, January 18, 2001). A heavy mineral overburden sampling program was completed in 2000.

Mr. Dillman also completed an overburden sampling program on his claims in western Grimsthorpe Township. Zinc chromites that contain 1% to 2% zinc were noted. The commodity sought is diamonds. A magnetometer survey is proposed for the 2001 field season.

Grenville Gold Corporation

Grenville Gold Corporation continued exploration on the company's 31 unpatented claim units in Grimsthorpe Township. Gold mineralization has been confirmed on the property in quartz-arsenopyrite veins in outcroppings of sheared metasedimentary rocks; in boulders of quartz-arsenopyrite veins hosted in porphyry and altered metavolcanic rocks; in boulders of oxide iron formation and visible gold in friable pebbles of quartz sericite schist. In addition, delicate gold grains have been found in till. Exploration began with the initial discovery of gold grains in till in 1992 during detailed follow up to a reconnaissance soil sampling survey. Geological mapping, ground geophysical surveys, prospecting and geochemical surveys, trenching and diamond drilling have been completed to locate the bedrock source of the gold found in till and boulders. Magnetic and enzyme leach data indicate a complex, structurally disrupted area in the vicinity of gold-bearing boulders and gold geochemical anomalies. Work scheduled for 2001 includes a 1000 m diamond drill program to test gold geochemical anomalies identified in 1999. (Grenville Gold Corporation, press release, December 22, 2000)

Lydia Consolidated Diamond Mines of Canada Ltd. - Tudor Township

In August 2000, Lydia Diamond Mines and Acadia Minerals announced a proposed amalgamation of the 2 companies. Lydia is "engaged in the acquisition, exploration and development of diamond bearing rocks, principally in the Tudor Township area," (Lydia Diamond Mines, press release, August 2000). The company reported that diamond indicator minerals and 4 diamonds were found on its Wolf Lake Property in southeastern Tudor Township between 1996 and 1998. Exploration work completed on the property in 2000 included diamond drilling, stripping, bedrock sampling, geological mapping and geophysical surveys. The company also recorded a large number of claims in adjoining Grimsthorpe Township.

Pelangio Mines Inc. - Simon Copper Property

Pelangio Mines Inc. staked the Simon Copper Property in Denbigh and Lyndoch townships in December 1999. The property has a long but intermittent history of exploration. Previous owners have defined two significant zones of mineralization.

The South Zone was explored by Young Davidson Mines Ltd. and Noranda Exploration Company Ltd. where work conducted both of these companies defined copper mineralization along a strike length of at least 200 m, with most work concentrating above the 106 m vertical level. A single, deeper diamond drill hole intersected copper-zinc mineralization, however, assays were not reported. In the early 1960s Young Davidson Mines Ltd. outlined a resource of 253 000 tons grading 1.09% Cu in the South Zone above the 106 m level. Although sphalerite was reported in the drill logs, assaying for zinc was not completed. Surface grab samples on the South Zone by the Ontario Geological Survey returned values ranging from 0.16% to 3.4% Zn.

Only limited work has been completed on the North Zone where copper mineralization is hosted in an iron formation. Six short diamond drill holes, completed by the prospector who originally discovered the showing, intersected chalcopyrite over widths ranging from 0.61 m to 3.66 m. A surface grab sample from this zone collected by Noranda returned a value of 11.2% Cu. A single drill hole by Noranda on the North Zone intersected narrow, magnetite-rich iron formations with pyrite, pyrrhotite and chalcopyrite.

According to press releases by Pelangio Mines inc., the company considers the property to be a highly prospective copper-zinc volcanogenic massive sulphide target. The company will complete a 525 m diamond drill program on the prospect to evaluate the South Zone along strike and at depth in January 2001. (Pelangio Mines Inc., press releases, December 12, 2000, January 12, 2001)

Phelps Dodge Corporation of Canada Ltd.

In 2000, Phelps Dodge Corporation of Canada Ltd. continued exploration in southeastern Ontario on 3 unpatented mining claim properties recorded in the fall of 1999. Additional work including winter geophysical surveying is planned for two of the properties in 2001. (P. Chamois, Phelps Dodge Corporation of Canada Ltd., personal communication, January 2001)

St. Lawrence Wollastonite - Pittsburgh Township

Property holder, Bob Vasily is actively seeking to develop the St. Lawrence Wollastonite deposit in Pittsburgh Township. U.S.Borax completed advanced exploration and evaluation under an agreement with Mr. Vasily commenced in February 1992. The property was returned to Mr. Vasily in August 2000, together with titles and documentation of exploration and development work.

The total mineable mineral resource is calculated to be 9.6Mt with an average grade of 38.1% wollastonite. Of that total, 5.1Mt has been measured with a high degree of confidence (measured, indicated and drill inferred reserves) with an average block reserve grade of 41.3%. The remaining 4.5Mt was calculated through geologic inference based predominantly on surface outcrop. A grade of 34.5% assigned to the inferred reserves is based on the overall average grade of both wollastonite and adjacent calc-silicate zones.

The deposit has an additional 3.7 million tonnes of calc-silicate ore independent of the wollastonite skarn reserves. Potential co-products are garnet and diopside.

Mr.Vasily completed market research, transportation studies and the acquisition of additional property in 2001. (B. Vasily, personal communication, January 2001).

Teck Corporation

In December 2000, Teck Corporation closed offices in Toronto, North Bay, and Nevada. Their easternmost office is now located in Marathon, Ontario. Teck Corporation had been exploring a zinc property in southeastern Ontario located on lots 10 to 13, Concessions 17 and 18 in Cavendish Township. Assessment work was filed in 1998 for line cutting, diamond drilling and drill core assaying from exploration work conducted on the property in November 1997. The property has since been returned to the original owners. (Teck Corporation, personal communication, January 2001)

Tulonen and King - Tudor Township Property

A 1998 OPAP exploration program in Tudor Township by Brian King and Paul Tulonen resulted in the discovery of several mineralized zones that were tested by diamond drilling to reveal a SEDEX-type base metal horizon. A thick sequence of graphitic argillite with semi-massive sulphides, black chert and interbeds of felsic-intermediate tuff with occasional intermediate-mafic volcaniclastic sediments was the target of the 1998, diamond drill program. Significantly enriched sulphide zones were encountered in both of the drill holes. Graphite content varied from <1% to 35%. Assay results for zinc ranged from 97 ppm to 1.5% over a 5-foot width, while anomalous copper values ranged from 110 ppm to 930 ppm. Continued exploration to identify the presence of any potential alteration pipes that could signify a proximal exhalative deposition site is recommended by Tulonen and King. (B. King, personal communication, January 2001)

Wollasco Minerals Inc. - Olden Township

The property is located in Olden Township, south of Highway 7 and 55 km northwest of Kingston. Drill indicated reserves to a depth of 75 m are 2.9 million tons. The grade of the deposit is estimated at 30% wollastonite with most of the remaining rock being high quality calcite. Wollasco reports that the wollastonite has a very high aspect ratio that increases with grinding e.g. the average aspect ratio at –200 mesh is 20 and at –300 mesh is 24. The matrix rock is comprised of very high brightness calcite that may serve as a potential co-product.

In 2000, Wollasco retained Alsobrook & Company Inc. of Medford, New Jersey to supervise a program to establish test procedures for the assaying of wollastonite product. Research will determine if a second stage of grinding is required after the initial grinding stage to liberate the wollastonite from the calcite host. Flotation tests, air table separation, magnetic separation and testing various grinding procedures to final product size will then be completed.

If this work succeeds in establishing a process for good recovery of high aspect ratio, finely ground wollastonite, the company will seek financing to build a pilot plant or mini-mill to produce wollastonite and calcite product. (Robert Opekar, Wollasco Minerals Inc., personal communication, December 2000)

Table 3. Assessment Files Received in 2000 – Southern Regional Resident Geologist (Southeast).

Abbreviations

AEM ..... Airborne electromagnetic survey
AM ..... Airborne magnetic survey
ARA ..... Airborne radiometric survey
Beep ..... Beep Mat survey
Bulk ..... Bulk sampling
DD ..... Diamond drilling
DDH ..... Diamond drill hole(s)
DGP ..... Down-hole geophysics
GC ..... Geochemical survey
GEM ..... Ground electromagnetic survey
GL ..... Geological Survey
GM ..... Ground magnetic survey
GRA ..... Ground radiometric survey
Grav ..... Gravity survey
HLEM ..... Horizontal loop electromagnetic survey
HM ..... Heavy mineral sampling
IM ..... Industrial mineral testing and marketing
IP ..... Induced polarization survey
Lc ..... Line cutting
Met ..... Metallurgical testing
OD ..... Overburden drilling
ODH ..... Overburden drill hole(s)
OMIP ..... Ontario Mineral Incentive Program
OPAP ..... Ontario Prospectors Assistance Program
PEM ..... Pulse electromagnetic survey
PGM ..... Platinum group metals
Pr ..... Prospecting
RES ..... Resistivity survey
Samp ..... Sampling (other than bulk)
Seismic ..... Seismic survey
SP ..... Self-potential survey
Str ..... Stripping
Tr ..... Trenching
UG ..... Underground exploration/development
VLEM ..... Vertical loop electromagnetic survey
VLFEM ..... Very low frequency electromagnetic survey

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
1. Barrie (Au)	Glanfield, M.E.	99-00	Pr, Geol, Samp	2.20031	110
2. Bedford (Graphite)	Graphite Mountain Inc.	99-00	Drill, Samp	2.20251	39
3. Brougham (Feldspar)	Coltas, P.C./Ash, D.	98	Geol, Pr, Samp, GC	OP98-293; 294	15
4. Brougham (Graphite)	Stewart, R.V.	98	Geol, Samp	OP98-142	16
5. Camden East (Diamonds)	Surmacz, S./Hauseux, M./Gallo, E.	92	Pr, HM, Samp	OP92-074; 075; 076	2
6. Cardiff (Mineral Specimens)	Fouts, C.	99	Geol	2.19929	227
7. Cavendish (Limestone)	Windover, B.J.	98	Str	2.19734	112
8. Cavendish (Vermiculite)	Regis Resources Ltd.	99	Pr	2.20105	113
9. Cavendish (Vermiculite)	Regis Resources Ltd.	2000	Grid, Str, Tr, IM, Pr	2.20419	114
10. Cavendish (Vermiculite)	Regis Resources Inc.	1999	Pr	2.20418	115
11. Cavendish (Vermiculite)	Regis Resources Ltd.	99-00	Pr, Tr, Str, Samp	2.20489	116
12. Clarendon (Zn, Au)	E-Minerals Exploration Corp.	97-00	GC, Samp, Grid, Pr	2.20062	46
13. Darling (Au)	Rampton, V.	99	Geol, GC,GM, GEM, Pr, Samp, Lc	2.20212	79
14. Darling (Marble)	Connolly, A.J.	99	IM, Pr	2.20249	80
15. Faraday (Marble)	Kellar, R.	97	DD	2.19980	87
16. Galway (Limestone)	Johnston, M.	99	Pwr Str, Geol, Bulk	2.19771	37
17. Griffith (Marble)	Two Island Marble Corporation	99	Phys	2.19776	20
18. Grimsthorpe (Au)	Beesley, T.J./Laidlaw, C.J.	98-99	HM, Geol	2.20362	69

	Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
19.	Harvey (Limestone)	Tomlinson, M.G.	98-00	Pwr Str, Pr, Geol	2.20363	12
20.	Kennebec (Au)	Veley, H.	98	Samp, Str	OP98-260	12
21.	Lavant (Au)	Gleeson, C.; Rampton, V.	99	DD, Samp	2.20247	57
22.	Lyndoch (Graphite)	Stewart, R.V.	98	Grid, Geol, Samp	OP98-142	39
23.	Lyndoch (Graphite)	Stewart, R.V.	99-00	Geol, Tr,Str, Samp	2.20645	40
24.	Madoc (Hematite)	Thompson, L.G.D.	99-00	Grid, GM, Grav, Geol	2.20360	140
25.	Marmora (Au)	Ross, R.J.	99-00	Lc, Samp, Geol, GC, GM, GEM	2.20026	86
26.	Mayo (Marble)	Upper Canada Stone Co.	2000	Drill, Samp	2.20448	24
27.	McClintock (BM, PGM)	Ellerington, W.C.	99-00	Samp	2.20250	51
28.	McClintock (Quartz)	Jones, F.E.	2000	Str, Tr	2.20420	52
29.	Methuen (Gramite)	Belmont Rose Holdings Inc.	99-00	Grid, Str, Geol, IM	2.20119	38
30.	Methuen (Limestone)	Brown, W.J.	98-00	Pr, Bulk	2.20248	39
31.	Monmouth	Rae, A.	98	Geol, Pr, Samp, Str	OP98-275	147
32.	Monmouth (Min. Spec.)	Rae, A.	98	Pr, Samp	2.20364	148
33.	Monmouth (Min. Spec.)	Sharpmin Dev. Inc.	2000	Tr, Samp	2.20361	149
34.	Monmouth (Mineral Specimen)	Fouts, C.	2000	Tr	2.20671	150
35.	Monmouth (Mineral Specimen)	Bramham, M.	98-00	Pr, Geol	2.20611	151
36.	Murchison (REE)	Reed, A.A.	99	Tr, Str	2.19825	4
37.	North Burgess (Graphite)	Graphite Mountain Inc.	99-00	Str, Tr	2.20028	18
38.	North Burgess (Graphite)	Graphite Mountain Inc.	2000	Pwr Str, Tr	2.20534	19
39.	Raglan (PGE,BM,Diam.)	Dillman, R.J.	2000	HM	2.20728	27
40.	Sheffield (Dimension Stone)	Senator Stone Supply	99	Str, Tr	2.20122	17
41.	Sophiasburgh (Diamonds)	Surmacz, S. /Hauseux, M. /Gallo, E.	92	Pr, HM, Samp	OP92-074; 075; 076	1
42.	Tudor (Au)	Hodgson, R.	98	Geol, Samp	2.20046	88
43.	Tudor (Au)	Hodgson, R.G.	98	Grid, Str, Tr, GC, Geol, Pr, Samp	OP98-033	90
44.	Tudor (Au)	Dillman, R.J.	98	Lc, Tr, Str, GC, Geol, Pr, Samp	OP98-056	91
45.	Tudor (Au)	Dillman, R.J.	99	DD, Samp	2.20421	92
46.	Tudor (Au, Diamonds)	Dillman, R.J.	99-00	HM, Pr, Samp	2.20135	68
47.	Tudor (BM, Au)	Tulonen, P. /King, B.	98	DD, Samp	OP98-244; 245	89
48.	Tudor (Diam.)	Von Anhalt, E&J	99-00	GM, Pwr Str, Tr, Samp	2.20195	93

Table 4. Exploration Activity in 2000 – Southern Regional Resident Geologist (Southeast).

Abbreviations

AEM	Airborne electromagnetic survey
AM	Airborne magnetic survey
ARA	Airborne radiometric survey
Beep	Beep Mat survey
Bulk	Bulk sampling
DD	Diamond drilling
DDH	Diamond drill hole(s)
DGP	Down-hole geophysics
GC	Geochemical survey
GEM	Ground electromagnetic survey
GL	Geological Survey
GM	Ground magnetic survey
GRA	Ground radiometric survey
Grav	Gravity survey
HLEM	Horizontal loop electromagnetic survey
HM	Heavy mineral sampling
IM	Industrial mineral testing and marketing
IP	Induced polarization survey
Lc	Line cutting
Met	Metallurgical testing
OD	Overburden drilling
ODH	Overburden drill hole(s)
OMIP	Ontario Mineral Incentive Program
OPAP	Ontario Prospectors Assistance Program
PEM	Pulse electromagnetic survey
PGM	Platinum group metals
Pr	Prospecting
RES	Resistivity survey
Samp	Sampling (other than bulk)
Seismic	Seismic survey
SP	Self-potential survey
Str	Stripping
Tr	Trenching
UG	Underground exploration/development
VLEM	Vertical loop electromagnetic survey
VLFEM	Very low frequency electromagnetic survey

No.	Company/Individual (Occurrence Name) or Property	Township/Area (Commodity)	Exploration Activity
1.	Archibald, Alan A.	Galway (Vermiculite)	Samp
2.	Archibald, Fred T.	Cavendish (Vermiculite)	Samp
3.	Archibald, John C.	Galway (Vermiculite)	Samp
4.	Ash, Duncan	Brougham (IM)	Samp
5.	Beesley, Timothy	Grimsthorpe (Au, PGE)	Samp
6.	Belmont Rose Holdings Inc.	Methuen (Dimension Stone)	IM, Str, Geol
7.	Blue Marble International	Galway (Vermiculite)	Tr, Samp, Geol, Analyses
8.	Bramham, Mark	Monmouth (Min. Specimens)	Pr, Geol
9.	Brown, William J.	Methuen (Limestone)	Pr, Bulk
10.	Cairntech	Madoc (IM)	Pr, Samp, IM
11.	Chard, James M.	Grimsthorpe (Au, BM, Diamonds)	HM
12.	Connolly A.	Darling	IM, Pr
13.	Dacre Industrial	Griffith (Dim. Stone)	Str, Geol
14.	Diamond Lake Minerals Inc.	North Burgess, Bedford (Graphite)	Str, Tr, Drill, Samp
15.	Dillman, Robert J.	Grimsthorpe (Au, Diamonds)	HM, Samp, Pr
16.	Dillman, Robert J.	Raglan (BM, PGM, Diamonds)	HM
17.	Dubblestein, A.	Ashby (IM)	Pr
18.	Dupres, J.	Elzevir (Soapstone), Monmouth (Min. Specimens)	Pr
19.	Ellerington, W.C.	McClintock (BM, PGM)	Samp

No.	Company/Individual (Occurrence Name) or Property	Township/Area (Commodity)	Exploration Activity
20.	Fouts, Christopher	Monmouth (Min. Specimens)	Tr
21.	Globex Mining Enterprises Inc.	Kaladar (Diamonds)	Samp
22.	Grenville Gold Corp.	Grimsthorpe (Au)	Samp
23.	Guillet, R.	Monmouth (IM)	Geol
24.	Highwood Resources	Kaladar (Mica)	IM, DD
25.	International Quartz	McClintock (Quartz)	Str, Tr, DD, Geol
26.	Kennedy, W.S.	Bedford (Quartz, Feldspar)	Geol
27.	Kretschmar, U.	Methuen, Belmont (Silica, Marble)	IM
28.	Laidlaw, James	Grimsthorpe, Anglesea (Au, PGE)	Samp, Pr
29.	Lashbrook, R.	Cavendish (Stone)	Pr
30.	Lydia Diamond Mines	Tudor (Diamonds)	GM, Str, Tr, Samp
31.	Millford Minerals	Elzevir (Dim. Stone)	Str
32.	Palu-Corbelli Corp.	Darling, Sheffield, Elzevir (Dim. Stone)	Bulk
33.	Pelangio Mines Inc.	Lyndoch, Denbigh (BM)	DD
34.	Phelps Dodge	Madoc, Darling (BM)	Pr
35.	Randsburg International Gold Corp.	McClintock (PGM)	Samp
36.	Regis Resources Ltd.	Cavendish (Vermiculite)	Str, Tr, IM, Pr
37.	Roach, S.	Lavant (BM)	Geol
38.	Ross, J.R.	Cavendish (REE)	Geol, Samp
39.	Ross, Robert J.	Tudor (IM)	Pr
40.	Sharpmin Developments Inc.	Monmouth (Min. Specimens)	Tr, Samp
41.	Stewart, Ralph V.	Lyndoch (Graphite)	Geol, Str, Tr, Samp
42.	Tomlinson, Mike G.	Harvey (Limestone)	Str, Pr, Geol
43.	Upper Canada Stone Company Ltd.	Cashel (IM)	Samp
44.	Wessell, Ingram	Lutterworth (Stone)	Samp
45.	Wilson, M.	Camden (Soapstone)	Samp

LAND USE PLANNING ACTIVITY

Ontario's Living Legacy – 2000

Fourteen *Ontario's Living Legacy* sites in the Great Lakes St. Lawrence Lowlands area are being considered for regulation this year as either Conservation Reserves or Provincial Parks, (see Table 5).

Table 5. *Ontario's Living Legacy* Sites Proposed for Regulation 2000 – Southern Regional Resident Geologist (Southeast).

OLL#	**Conservation Reserves**	*OLL#*	**Parks**
C-2	Crotch Lake	P-4	Puzzle Lake
C-3	Hungry Lake	P-8	Bon Echo Additions
C-14	Mellon Lake	P-34	Dalton, Digby Wildlands
C-42	Hawkins Property	P-56	Egan Chutes Provincial Park Extension
C-54	Conroy's Marsh	P-58	Barron River
C-55	Little Mississippi River	P-125	Bisset Creek
C-130	Greenbough Esker	P-126	Grants Creek

The Kawartha Highlands Signature Site is also being considered at this time. This site, located 50 km north of Peterborough in parts of Burleigh, Anstruther, Harvey and Cavendish townships, will be an addition to the existing Kawartha Highlands Provincial Park. The additional area, in excess of 33 500 hectares, will make this the largest protected area south of Algonquin Provincial Park.

A thirteen member, local stakeholder committee was appointed on July 13, 2000 to assist the Ministry of Natural Resources (MNR) in determining the most appropriate protection designation for this area – i.e. provincial park or conservation reserve status. The goal is to protect the natural and recreational values of the Kawartha Highlands.

This committee will also assist in finalizing the protected area boundary; developing management policies; and developing and implementing co-stewardship management of the area. Committee members do not represent special interest groups or associations, but rather each member was selected based on their background, range of experience and interests.

The committee has invited public input and comment in the form of written submissions or oral presentations to the committee, to be received by the end of February 2001. A number of open houses were held in the Kawartha Highlands and in Toronto area from September through to the end of November 2000. Recommendations to the MNR from this committee should be completed by the end of October 2001. The process for the designation under appropriate regulation is to be completed prior to December 2003.

Ministry of Municipal Affairs and Housing

Through the Ministry's commitment to mineral-related Provincial Policy Statements contained within the Planning Act, the Resident Geologist Program (RGP) staff provide comment and input into the development of municipal Official Plans and Official Plan Amendments through the Ministry of Municipal Affairs and Housing's one-window approach. In 2000, Tweed RGP staff reviewed Draft Official Plans, Official Plans (OP), and Official Plan Amendments for the following 24 municipalities:

Table 6. Municipal Plans Reviewed in 2000 – Southern Regional Resident Geologist (Southeast).

County	Municipality	Plan Type
Frontenac	South Frontenac	OP
Frontenac	Twp. Of Frontenac Islands	OP, Zoning By-law
Frontenac	Central Frontenac	Draft OP
Haliburton	Lutterworth	Draft OP Application
Haliburton	Lutterworth	OP
Hastings	Hastings County	OP
Hastings	City of Quinte West	Draft OP Application
Hastings	City of Belleville	Draft OP Application
Hastings	City of Quinte West	OP
Lennox & Addington	Loyalist	Draft OP
Lennox & Addington	Town of Greater Napanee	Draft OP
Lennox & Addington	Twp. Of Stone Mills	OP
Lennox & Addington	Twp. Of Stone Mills	Mod. To OP
Lennox & Addington	Loyalist	OP
Nipissing	South Algonquin Twp.	Five Consents
Northumberland	Campbellford-Seymour, Percy, Hastings	Draft OP
Northumberland	Pine Ridge	Draft OP
Northumberland	Campbellford/Seymour, Percy & Hastings	OP Application
Northumberland	Hope	Draft OP Amendment
Peterborough	Cavan-Millbrook-North Monaghan	Draft
Renfrew	Petawawa	Draft OP
Renfrew	City of Pembroke	Draft OP Application
Stormont, Dundas & Glengarry	North Glengarry	Draft OP
Stormont, Dundas & Glengarry	North Glengarry	OP

The Resident and District Geologists attended a number of inter-ministerial meetings hosted by MMAH to review current Official Plans. In December 2000, a review of a number of Official Plans was also completed as part of the five-year review process for Provincial Policy Statements (PPS). The objective of this initiative was to undertake a review of a stratified, random sampling of 25 "Pre-Bill 20" Official Plans and 25 "Bill 20" Official Plans from across the province to assess the differences between "pre-Bill 20" and "Bill 20" Official Plans. The evaluation considered: the extent to which the Provincial Policy Statements are being reflected in Official Plans; best practices; emerging issues and additional issues which may require provincial policy direction.

Regional Land Use Geologists

In the fall of 2000, the Ministry of Northern Development & Mines hired three individuals to fill the newly created Regional Land Use Geologists (RLUG) positions. In conjunction with other staff within the Resident Geologist Program, these new staff members will be involved in Crown land planning and management. The Regional Land Use Geologists will serve as the main contacts within the Mines and Minerals Division for land use planning issues and initiatives such as *Ontario's Living Legacy,* MNR's Strategic Lands Initiative and access road issues related to the Forest Management Planning process. Dave Rowell is the RLUG responsible for southern Ontario south of the French River and Manitoulin Island.

RESIDENT GEOLOGIST PROGRAM (RGP) STAFF AND ACTIVITIES

During 2000, staff of the Southern Ontario Regional Resident Geologist (Southeast) office included: P.J. Sangster, Regional Resident Geologist; V.C. Papertzian, Southeast District Geologist and D.A. Laidlaw, Southeast District Support Geologist. J. Fabian and C. Morrison provided field season support under the Summer Experience Program. Geological Consultant C.R. Ware and J.C. Laidlaw were hired on short-term contracts to work exclusively on upgrading of the Mineral Deposit Inventory Database.

There are over 6500 Mineral Deposit Inventory (MDI) records for southeastern Ontario. During 2000, extensive time has been devoted to verifying the MDI database and adding information related to new client property visits. Over 2690 MDI files have been reviewed. A recurring problem with the existing database has been the inclusion of records that do not meet the minimum standards for inclusion in the database. In 2000, 726 such records were deleted from the database.

Southern Ontario mineral potential and recommendations for exploration were represented at the annual Prospectors and Developers Association of Canada Convention in Toronto as part of the Ontario Geological Survey poster session. In conjunction with staff of the Southwest District, a display highlighting "Minerals and Metals Moving to Markets" was presented at the Northeastern Ontario Mines and Minerals Symposium in Kirkland Lake and the Northwestern Ontario Mines and Minerals Symposium in Thunder Bay. In early August, a display dealing with Mining and Exploration in Southern Ontario was presented at the Bancroft Gemboree.

The Mineral Resource Partnership presented a poster session and interactive display highlighting Ontario's Mineral Resources at the International Plowing Match in Wellington County September 18 to 22. Partners included: the Ministry of Northern Development & Mines (both Tweed and Toronto RGP offices), Royal Ontario Museum, University of Waterloo, Dufferin Aggregates, Blue Circle, Bancroft Chamber of Commerce and the PDAC's Mining Matters. Thousands of thumbnail samples of Southern Ontario rocks and minerals including talc, brachiopods, fossil coral, granite and marble were distributed.

Also in September, Southern Ontario hosted the annual Resident Geologist Program meeting/workshop/field trip in Acton, Ontario. A field trip to the OMYA Canada Ltd.'s Tatlock quarry and Omega blue marble quarry was given in October for members of the Southern Ontario Prospectors Association. The Regional Resident Geologist and District Geologist for southwestern Ontario collaborated with Myra Gerow, MNDM Coordinator, Commodities Program, presented a poster on Industrial Minerals of Ontario at the Blendon Industrial Minerals Forum in Toronto in October. In mid-December, staff attended the Southern Ontario Symposium where a poster display titled "A Billion Dollar Industry – Mineral Resources of Southern Ontario" was presented. The Regional Resident Geologist and District Geologist for southwestern Ontario jointly prepared and presented a talk highlighting current production and potential for additional development of industrial minerals in Southern Ontario.

In 1998, a project designed to rehabilitate the offsite drill core storage compound and upgrade the drill core library indexing system was initiated. The deterioration of exposed wooden drill core boxes and storage pallets is an ongoing challenge at the offsite drill core storage compound. During the summer and fall of 2000, one hundred pallet roofs were constructed from galvanized steel roofing and fixed in place. Two pallets of core were moved from the Tweed drill core library to the offsite location. In addition, diamond drill core stored on a number of wooden pallets was re-stacked onto new steel pallets and encroaching vegetation at the offsite compound was removed.

Staff conducted visits to 47 client properties in the District during the 2000 field season. For a complete listing of client property visits, please refer to Table 7.

During the course of the year, 48 industry assessment reports were processed and added to the Tweed Regional Resident Geologist office assessment file library. For details please refer to Table 3, this report. Table 8 provides a summary of office activity and Table 9 lists additions made to the Tweed technical library during 2000.

Southern Ontario Prospector's Association (S.O.P.A.)

In January 2000, the Southern Ontario RGP hosted an information session attended by 40 people directly involved in southern Ontario's mineral industry. This meeting brought together people with a common interest in organizing a southern Ontario prospectors' group.

At the Southern Ontario PGE seminar/prospectors' meeting held in late May and organized by the Tweed Regional Resident Geologist office, 37 attendees received a questionnaire developed by Chris Fouts, Bancroft Chamber of Commerce concerning the formation of the Southern Ontario prospectors' group. A volunteer executive was selected and they agreed to meet in Tweed the following month to discuss the results of the survey.

The Southern Ontario Prospectors Association (SOPA) officially formed on June 20th. SOPA is a non-profit association representing its membership of prospectors, explorationists, mineral collectors and mining companies working in or having an interest in southern Ontario. It will provide access to information within the mineral exploration community and also serve as a voice to lobby Government on mineral-related/land access issues for southern Ontario. Through an affiliation with the Ontario Prospectors Association (OPA), SOPA will be represented on the Ontario Geological Survey Advisory Board.

In October, the Tweed Regional Resident Geologist office organized a field trip for SOPA to OMYA Canada Inc.'s Tatlock marble quarry and Omega blue marble quarry. In December, SOPA participated in the Ontario Exploration and Geoscience Symposium held in Toronto.

Table 7. Property Visits Completed in 2000 – Southern Regional Resident Geologist (Southeast) (Keyed to Figure 3).

Property	Commodity
1. Ackerman mine site (past producer, gold)	Hazard Inspection
2. Addington mine site (past producer, gold)	Kimberlite
3. Adobe Ventures Ltd. property (inactive)	Hazard Inspection, Scientific Interest
4. J. Archibald property	Vermiculite
5. Bark Lake - Maynooth	Scientific Interest
6. Belmont Rose Granite Quarry	Dimension Stone
7. Blakely minesite (past producer, fluorite)	Fluorite, Hazard Inspection
8. Blue Marble Corp.	Vermiculite
9. Cairntech - Madoc Township Stockpiles	Soil Conditioner
10. Camden Township - Varty Lake Kimberlite	Scientific Interest
11. Dacre Industrial Minerals (Two Island Marble)	Dolomitic Marble
12. Diamond Lake Minerals Inc., Graphite Mountain	Graphite
13. Dubblestein - Simpson Lake prospect	Dolomitic marble
14. Gawley #1 minesite (past producer gold)	Hazard Inspection
15. Highwood Resources Limited, Canada Talc Division, Henderson Mine (underground)	Talc
16. Highwood Resources Limited, Canada Talc Division (surface)	Talc
17. Hollandia property (past producer, lead)	Hazard Inspection
18. Hungerford Township	GSC Seismic Survey
19. Lacey property (past producer, mica)	Hazard Inspection
20. Lydia Diamond Mines	Diamond Prospect
21. Lakefield Research	Facility Tour
22. Madoc Township (old workings)	Quartz veins
23. Madoc Township, Quinte Conservation Authority (old workings)	Hazard Inspection
24. Maloney minesite (past producer, iron)	Hazard Inspection
25. Marmora Township wollastonite deposit (Platinova)	Wollastonite
26. McDonald Feldspar minesite (past producer)	Mineral Specimens
27. MNR Frost Centre	Facility Tour
28. Mundic mine site, (past producer, pyrite)	Hazard Inspection
29. North Hastings Aggregate Quarry	Crushed Aggregate
30. OMYA Canada Inc., Omega Marble Quarry	Dimension Stone
31. OMYA Canada Inc., Perth Plant	Calcium Carbonate
32. OMYA Canada Inc., Tatlock Quarry	Calcitic Marble
33. Palu-Corbelli Sheffield Township prospect	Granite
34. Palu-Corbelli Kaladar Township prospect	Granite
35. Ross Prospect, Tudor Township	Traprock
36. Senator Stone, Elzevir Township	Marble
37. Senator Stone, Temagami Pink	Dimension Stone
38. Senator Stone, Tweed Marble quarry	Dimension Stone
39. Tudor Township (old workings)	Quartz veins
40. Upper Canada Stone, Mephisto Lake Quarry	Marble
Visits Outside District	**Commodity**
41. Canada Brick - Burlington Quarry & Brick Plant	Shale
42. Georgia-Pacific - Caledonia No. 3 Mine & Wallboard Plant	Gypsum
43. Milton Quarry, Dufferin Aggregates	Crushed Stone
44. Niagara Escarpment	Scientific Interest
45. Rice and McHarg Ltd.	Sandstone
46. Sifto Canada Inc., Goderich Mine	Salt
Visits Outside Region	**Commodity**
47. Lac des Iles Mine	Palladium

Table 8. Statistics for 2000 – Southern Regional Resident Geologist (Southeast).

Activity	1998	1999	2000
Field Investigations/Property Visits	34	45	47
Field Trips Given/Field Guide Written	2	4	1
MDI Records Revised	0	1550	2690
OPAP Recipients	11	22	N/A
MMAH Presentations	4	3	2
Clients Visits to Tweed RGP Office	501	508	676
Drill Core Library Users	16	23	31
Client Communications/Interactions (Presentations/Poster Sessions)	N/A	2375	2619
Client Inquiries (Telephone/E-mail/Mail)	2172	2079	2163
OGS Publications Sold	112	73	93
Prospector's Licenses Sold	21	10	21
Claim/Line Tags Sold	197	408	261

Table 9. Library Acquisitions 2000 – Southern Regional Resident Geologist (Southeast).

Title	Author	Type and Year of Publication
Aggregate Resources Inventory of Victoria County	Geomatics International Limited and Rowell, D.J.	OGS, Aggregate Resources Inventory Paper 165, 2000
Sand and Gravel Resources of Victoria County - North Half of the County (Townships of Dalton, Laxton, Digby and Longford, Carden, Bexley and Somerville)	Geomatics International Limited and Rowell, D.J.	OGS, Aggregate Resources Inventory Map 168-1A, scale 1:50 000, 2000
Sand and Gravel Resources of Victoria County - South Half of the County (Townships of Eldon, Fenelon, Verulam, Mariposa, Ops, Emily, Manvers)	Geomatics International Limited and Rowell, D.J.	OGS, Aggregate Resources Inventory Map 168-1B, scale 1:50 000, 2000
Bedrock and Resources of Victoria County - North Half of the County (Townships of Dalton, Laxton, Digby and Longford, Carden, Bexley and Somerville)	Geomatics International Limited and Rowell, D.J.	OGS, Aggregate Resources Inventory Map 168-2A, scale 1:50 000, 2000
Bedrock Resources of Victoria County - South Half of the County (Townships of Eldon, Fenelon, Verulam, Mariposa, Ops, Emily, Manvers)	Geomatics International Limited and Rowell, D.J.	OGS, Aggregate Resources Inventory Map 168-2B, scale 1:50 000, 2000
Quaternary Geology, Radisson Lake Area	Bajc, A.	OGS, Map 2610, scale 1:50 000, 2000
Quaternary Geology, Peterlong Lake Area	Bajc, A.F.	OGS, Map 2611, scale 1:50 000, 2000
Till Compositional Database, River Valley Area, Northeastern Ontario	Tardif, N.P.	OGS, Miscellaneous Release - Data 53, 2000
Exploration Guidelines and Opportunities for Dimensional Stone in Central Ontario	Marmont, C.	OGS, Open File Report 5853, 1993
Kimberlite of the Lake Timiskaming Structural Zone	Sage, R.P.	OGS, Open File Report 5937, 1996
Regional Geological Setting of the Hemlo Gold Deposit; an Interim Progress Report	Jackson, S.L., Beakhouse, G.P. and Davis, D.W.	OGS, Open File Report 5977, 1998
Report of Activities 1999, Resident Geologist Program, Red Lake Regional Resident Geologist Report: Red Lake and Kenora Districts	Hinz, P., Storey, C.C., Gosselin, S.DM., Blackburn, C.C. and Kosloski, L.	OGS, Open File Report 6003, 2000
Report of Activities 1999, Resident Geologist Program, Thunder Bay North Regional Resident Geologist Report: Thunder Bay North and Sioux Lookout Districts	Mason, J.K., Farrow, D., Seim, G., White, G.D., O'Brien, M.S., Walden, A. and Komar, C.	OGS, Open File Report 6004, 2000
Report of Activities 1999, Resident Geologist Program, Thunder Bay South Resident Geologist Report: Thunder Bay South District	Schnieders, B.R., Scott, J.F., Smyk, M.C. and O'Brien, M.S.	OGS, Open File Report 6005, 2000

Title	Author	Type and Year of Publication
Report of Activities 1999, Resident Geologist Program: Timmins Regional Resident Geologist Report: Timmins and Sault Ste. Marie Districts	Atkinson, B.T., Hailstone, M.H., Ravnaas, C.B., Wilson, A.C., Draper, D.M., Hope, P., Morra, P.M. and Beauchamp, S.A.	OGS, Open File Report 6006, 2000
Report of Activities 1999, Resident Geologist Program, Kirkland Lake Regional Resident Geologist Report: Kirkland Lake and Sudbury Districts	Meyer, G., Cosec, M., Grabowski, G.P.B., Guindon, D.L., Chaloux, E.C. and Charette, M.	OGS, Open File Report 6007, 2000
Report of Activities 1999, Resident Geologist Program, Southern Ontario Resident Geologist Report: Southeastern and Southwestern Districts, Mines and Minerals Information Centre and Petroleum Resources Centre	Sangster, P.J., McGuinty, W.J., Papertzian, V.C., Steele, K.G., Lee, C.R., Laidlaw, D.A. and Carter, T.R.	OGS, Open File Report 6008, 2000
Garden-Obonga Lake Area High Density Lake Sediment and Water Geochemical Survey, Northwestern Ontario	Jackson, J.E. and Dyer, R.D.	OGS, Open File Report 6009, 2000
Regional Distribution of Platinum, Palladium, Gold, Kimberlite Indicator Minerals and Base Metals in Surficial Sediments, River Valley Area, Northeastern Ontario	Tardif, N.P.	OGS, Open File Report 6010, 2000
Paleozoic Geology of the Northern Lake Simcoe Area, South-Central Ontario	Armstrong, D.K.	OGS, Open File Report 6011, 2000
Results of Regional Till Sampling in the Western Part of the Shebandowan Greenstone Belt, Northwestern Ontario	Bajc, A.F.	OGS, Open File Report 6012, 2000
Kimberlite, Base Metal, Gold and Carbonatite Exploration Targets Derived from Overburden Heavy Mineral Data, Killala Lake Area, Northwestern Ontario	Morris, T.F., Sage, R.P., Crabtree, D.C. and Petrie, S.	OGS, Open File Report 6013, 2000
The Distribution of Gold Grains in Till, Sachigo River Mine, Northwest Ontario	Stone, D., Hallé, J. and Lange, M.	OGS, Open File Report 6015, 2000
The "Sandor" Diamond Occurrence, Michipicoten Greenstone Belt, Wawa, Ontario: A Preliminary Study	Sage, R.P.	OGS, Open File Report 6016, 2000
Kimberlites of the Lake Timiskaming Structural Zone: Supplement	Sage, R.P.	OGS, Open File Report 6018, 2000
Mines and Wines: Industrial Minerals, Geology and Wineries of the Niagara Region - Field Trip Guidebook	Steele, K.G. and Haynes, S.J.	OGS, Open File Report 6029, 2000
Summary of Field Work and Other Activities 2000	Ayer, J.A., Baker, C.L., Kelly, R.I., Parker, J.R., Stott, G.M. and Thurston, P.C. (editors)	OGS, Open File Report 6032, 2000
Precambrian Geology, Garden Lake Greenstone Belt (East Half)	Hart, T.R., Meyer, P., Martin, L.A. and Zurevinski, S.M.	OGS, Preliminary Map P.3423, scale 1:20 000, 2000
The Mines of Ottawa: A guide to the mineral deposits of Southeastern Ontario and Southwestern Quebec	Udd, John E.	CJ Multi-Media Inc., Nepean, Ontario, 375 p, 1999
Dynamic Processes in Magmatic Ore Deposits and their Application in Mineral Exploration	Keays, R.R., Lesher, C.M., Lightfoot, P.C. and Farrow, C.E.G. (editors)	Short Course Notes Volume 13, Geological Association of Canada, Mineral Deposits Division, St. John's, Newfoundland, 477p, 1999
Figuratively Speaking in the Computer Age - Techniques for Preparing and Delivering Presentations	Orchard, D.M., Perow, B.D. and Reed, T.	American Association of Petroleum Geologists, U.S.A., 101p, 2000
Abstracts for Diamonds in Eastern Canada	Various Authors	Toronto Geological Discussion Group, Toronto, Ontario, 2000
Volume 46 - Part 1: Program and Abstracts; Part 2: Field Trip Guidebook	Fralick, P. (compiled by)	Institute on Lake Superior Geology Proceedings, 46th Annual Meeting, Thunder Bay, Ontario, v. 46, part 1, p.2, 2000
Canadian Mines Handbook 2000 - 2001	Giancola, D. (ed.)	Southam Mining Publications Group, Toronto, 560p, 2000
Resource Integration: The Resource Industries and Aboriginal Community Development		

PROPERTY EXAMINATIONS

Dacre Industrial Minerals

The Dacre Industrial Minerals Property, formerly the Two Island Marble quarry, was visited by the District Geologist, on June 21, 2000 with the owner and a quarry master. This property is located in the unsurveyed northwestern part of Griffith Township. Trisar Resources explored the property between 1982 and 1985. During that time, the company conducted trenching, stripping and drilled 5 diamond drill holes. The property was first evaluated for industrial mineral fillers and later re-evaluated for dimension stone. In 1988, Two Island Marble Corporation commenced quarrying operations which ceased in the early 1990s. A finishing plant was located in Dacre, Ontario and contained a single wire saw, a hand operated polisher, a trim saw and a guillotine. The guillotine was used for the production of ashlar blocks.

There are three small, overgrown quarries at this site. The southernmost quarry is located within a sequence of interlayered calcitic and dolomitic marbles. The marbles contain 1 cm - 3 cm wide bands of pale blue, green and pink calcite veins.

Exposed to the west of this quarry is a 40 m to 50 m wide band of white, coarse-grained dolomitic marble. This band contains less than 3% impurities comprised of phlogopite, serpentine, and pale green mica.

Two additional small quarries to the northeast have been developed in the white, coarse-grained dolomitic marble. The zone strikes at 020° and dips 30° to the east. A band of impure calcitic marble occurs to the east of this zone. Phlogopite, hematite, graphite, pyrite and some amphibolite bands were noted along with some narrow bands of dolomite and pink granitic gneiss in this band.

During the past field season, Dacre Industrial Minerals completed detailed geological mapping between the north and south quarries described above, paying particular attention to joints and joint spacing. Subsequently, overburden stripping was performed in the same area. For the coming field season the company plans to quarry a number of test blocks for cutting and polishing as well as to test whether large blocks, in the 20 to 25 tonne range, can successfully be extracted.

Diamond Lake Minerals Inc. – Bedford Township

On June 15, 2000, the Resident and District Geologist toured the graphite property of Diamond Lake Minerals with Ramesh Mandal, Mineral Development Officer and David Houston and Brian King of Diamond Lake Minerals Inc.

The property is located in Bedford Township where exploration work has been conducted over three main areas, all of which have been stripped of overburden to expose the complex geology. The graphite is hosted in calcitic marble units that are highly contorted due to intense folding. The strong deformation has produced highly enriched graphitic zones, especially at the apex of folded units (King 1994). Numerous trenches were noted along with at least 16 diamond drill collars. Background graphite content in the marbles is in the order of 0.5% to 1.0%, with mineralized zones containing over 5.0% visible graphite. The mineralized zones have assayed a total carbon content of 7.0% to 20.0% (Easton 1997). The graphite is amorphous.

Two mineralized horizons are present with strike lengths up to 300 m and widths of 1 m to 3 m. Pods or lenses of graphite varying between 1 m to 3 m in length are contained in the marble on either side of

the main mineralized zone. The zones appear to be offset by a fault at their western extent and appear to be part of a regional synformal structure that plunges 30 degrees to the west (Easton 1997).

Work completed to date includes overburden stripping, trenching, bedrock sampling, air track drilling, diamond drilling, bulk sampling, bench testing and market research. Based on the results of the 1998 exploration program, James E. Tilsley and Associates report a resource volume of 2.4Mt in three geologically defined mineralized zones.

The main area, known as the Meadow Zone, is located in the southwest part of the property. Overburden stripping, to date has exposed an area approximately 60 feet by 120 feet as well as two small areas approximately 20 feet by 50 feet each. The total stripped area is approximately 9200 square feet (856 m^2). Limited diamond drilling and percussion drilling has been conducted in this area. The second mineralized zone, located south of the Meadow Zone has been exposed over an area that measures approximately 20 feet by 100 feet (185 m^2). The third mineralized zone, located northeast of the Meadow Zone encompasses stripped areas of 300 feet by 150 feet (4 186 m^2) and 20 feet by 60 feet (112 m^2).

To date approximately 5330 m^2 have been exposed through overburden stripping. Additional exploration is required to further define the graphite zones prior to conducting feasibility studies. Future plans include additional diamond drilling, reserve definition and acquisition of the necessary permitting to bring the deposit into production.

Palu - Corbelli Corporation, Darling Township

On October 16, 2000, staff of the Tweed Regional Resident Geologist office visited the Palu - Corbelli Corporation blue marble quarry in southeast Darling Township, east of the community of Tatlock. The quarry is located on lot 6, Con V, Darling Township. The Palu -Corbelli Corporation re-opened the quarry in 1999 under a lease agreement with the owner, OMYA (Canada) Inc.

Marble has been quarried for various applications in this area since the early 1900s. Omega Marble Tile and Terrazzo Ltd. opened the dimension stone quarry in 1962 and operated it until 1971. The quarry consists of a number of pits established in a zone of predominantly blue marble approximately 12 m thick that strikes northwest and dips to the northeast. The zone is underlain by a footwall band of hornblende-biotite schist and overlain by a hanging wall of crystalline limestone (Hogarth et al. 1972)

At the time of the field visit, test blocks were being cut using a diamond wire saw. The current operators have opened a new face to the immediate northwest of the former main quarry. A 2 m bench has been cut from the top of the exposed outcrop over a length of approximately 40 m to remove weathered and fractured marble on surface.

A second 3 m bench has been started in the fresh unfractured marble beneath. Numerous quarry blocks of varying quality have been sorted and stockpiled on site.

For detailed geology, please refer to Hewitt (1964) and Storey and Vos (1981).

The blue colour may be caused by anomalous boron or finely divided graphite in the calcite. Despite reports to the contrary, the blue colour does not appear to have faded on the marble's weathered surface (P. Sangster, C. Papertzian, personal observations, October 2000).

RECOMMENDATIONS FOR EXPLORATION

There are many high mineral potential areas in southeastern Ontario that remain inadequately explored despite the region's long history of mineral exploration and production. Traditional exploration targets in the Grenville Province of southeastern Ontario have been vein-hosted gold and base metal deposits. In recent decades, the focus has also been placed on the search for industrial mineral deposits. Changing technology has resulted in new demand for certain commodities not previously considered to be significant. Table 10 provides a listing of known mineral deposits in southeastern Ontario that are not currently being mined. Please refer to Tables 12, 13, 14 and 15 of this report for historic mineral production statistics.

Tantalum

The largest single use of tantalum is as a powdered metal in the production of capacitors. Mobile telephones will not function without capacitors. Capacitor demand has been growing globally with a current annual consumption of more than 600 billion pounds. During 2000, the price of tantalum almost doubled to US$120 to US$140 a pound. Table 11, in this report, supplies a listing of known tantalum occurrences in southeastern Ontario.

Mineral Fillers and Extenders

An ideal mineral filler substance is inert, has consistent properties, a low specific gravity, is non-toxic, non-hazardous, non-abrasive and can be produced at a relatively low cost. Fillers reduce the consumption of more expensive raw materials such as wood fiber or plastic resin. Extenders enhance the final product by improving properties such as strength, flexibility and weight. The use of finely ground minerals as fillers and extenders in manufactured products has rapidly grown to become a multi-billion-dollar industry in North America alone.

With major production of calcium carbonate, talc and nepheline syenite, southeastern Ontario is already the site of a vital mineral filler industry. Further evaluation of other minerals as fillers and extenders including, but not limited to mica, titanium, wollastonite, calcite, and vermiculite is recommended. There is a wealth of information published by the Ontario Geological Survey (OGS) on many potential mineral filler deposits in southeastern Ontario. Table 11, in this report, supplies a listing of known titanium occurrences in southeastern Ontario. In the spring of 2001, the OGS will release results of a study evaluating the potential of approximately 200 mica occurrences found in southern Ontario. Industrial Mineral Background Papers published by the OGS in the 1980s and 1990s highlight several specific fillers including wollastonite and vermiculite.

Dimension Stone

The suitability of a particular stone for use as dimension stone is governed primarily by physical properties and by aesthetic appeal. Although the physical criteria remain constant, whether or not a particular stone is considered to be "fashionable" is subject to change. Several dimension stone prospects originally evaluated during the MNDM building stone surveys of the 1980s were found to have acceptable physical properties, but were not of a colour or general appearance in demand at that time. The following occurrences are similar to sources of dimension stone from other countries that are currently popular and in demand. Re-examination of these selected sites is warranted.

QUARTZ PEBBLE CONGLOMERATE

This rock unit is found within the Bishop Corners Formation; a sequence of clastic, siliceous metasedimentary rocks that represent the basal unit of the Flinton Group that extends from southern Barrie Township, through the western part of Kaladar Township into southeastern Elzevir Township. Most of the quartzite clasts are pebble-sized, grey to white in colour and deformed to flattened, ellipsoidal shapes. The colour of the fresh surface ranges from silver to grey to white. The matrix is white to grey, fine to medium grained and varies from quartzo-feldspathic to micaceous compositions. The mica is foliated and flows around the quartz pebbles giving the rock a unique boudinaged appearance. The texture is both lineated and foliated which leads to a very pronounced fabric. The intensity of joint patterns and foliation is variable throughout the strike length of the formation, however, in the area previously sampled the jointing pattern is regular and moderate. An outcrop along highway 41 was sampled in 1986 as part of a regional building stone program. This sample, 86-KAL-009 was subsequently cut and polished. Extractable blocks at this location might be in the order of 1 m^3. The potential for the removal of small quarry blocks along with the unique appearance of this rock suggests that further investigation of this area as well as elsewhere along the formation is warranted. (LeBaron et al. 1990)

CALCITIC MARBLE BRECCIA

A sample of calcitic marble breccia extracted from an outcrop on the west side of highway 506, northwest of the village of Ardoch in Clarendon Township was cut and polished into 12 inch tiles. The fresh surface is white-greenish-pink-brown banded while the weathered surface is grey in colour. Grain size varies from fine to coarse and the stone is strongly foliated. The jointing pattern tended to be regular in nature and is moderately spaced at approximately 2 m. LeBaron et al. (1990) wrote the following description:

> "a highly foliated calcitic marble breccia. Due to stretching of the fragments, textures vary from coarse, fragmental when viewed perpendicular to the foliation, to irregularly banded when viewed paralle! to the foliation. Colour also varies from mottled brownish-grey and white at the southern end of the road cut, to pink-grey-white to the northern end."

The colour and textures of this stone are unique and there is potential for large quarry blocks. It is recommended that this area be investigated further.

PINK MARBLE BRECCIA

This prospect, located in Hungerford Township on lots 11and 12, Concession 14 on the Hawkins Bay road, northwest of the Tweed Marble Quarry, was not investigated during the 1985-86 building stone inventory conducted in eastern Ontario. On fresh surface, this calcitic marble is an attractive rose pink, ivory and dark grey breccia with isolated dark green areas. The weathered surface is light grey to pink. The grain size varies from fine to medium grained and there is a strong fabric formed by the foliation. Due to limited outcrop exposure, a jointing pattern could not be established and therefore the potential for quarry blocks could not be assessed. A small sample was removed from this site and cut and polished. It is recommended that further prospecting in this area be completed to determine the extent of the occurrence. (V.C. Papertzian, January 2001)

Table 10. Mineral Deposits Not Currently Being Mined 2000*– Southern Regional Resident Geologist (Southeast).

Deposit/Township	MDI Number	Status	Commodity	Reserves	Reserve Reference
Ore Chimney Prospect Barrie Township	MDI31C14SE-00142 (SO 1130)	I	Ag, Au ,Zn, Pb,	11 000 tons above 500 foot level avg. 0.2 oz Au, 5.64 oz Ag, 2.0% Zn, 1.0% Pb	MDC 12 p32 MDC 18 p33
Macassa Nickel Limerick Township	MDI31C13SE-00099 (SO 0595)	I	Ni ,Cu	2 000 000 tons @ 1.0% Ni, 0.25% Cu	MDC 12 p138
Renfrew Zinc (Renprior) Admaston Township	MDI31F07NE-00063 (SO 0286)	A	Zn	16 000 tons @ 10.5% Zn to a depth of 30 m Breakwater Resources optioned to Noranda Mining and Exploration 1996	MDC 12 p226 MDC 20 p17
Harvey Simon Prospect Lyndoch Township	MDI31F03NW-00044 (SO 0259)	I	Cu, Fe, Zn	250 000 tons @ 1.1% Cu to 350 feet	MDC 12 p226 MDC 20 p45
Clyde Forks Deposit Lavant Township	MDI31F02SE-00064 (SO 0351)	I	Cu, Sb, Ag, Hg	60 000 tons 0.67% Cu, 0.37.0% Sb, 0.03%, Hg , 1.32 oz/ton Ag	MDC 20 p36
Twin Lakes Diorite Methuen Township	MDI31C12NW-00114 (SO 3840)	I	Ti	13.2 million tonnes of 21.7% TiO2, recoverable from open pit to –165 m, with rock: ore ratio = 0:54	CIM Bulletin, v.83(934), p99
Grattan Deposit Grattan Township	MDI31F06NE-00017 (SO 0270)	I	Fe	Proven – 3 639 600 tons to a vein depth of 363 feet Indicated 9 099 000 tons to a vertical depth of 600 feet @ avg. 27.74% Fe	MDC 20 p98
Radenhurst-Caldwell Deposit Lavant Township	MDI31F02NE-00012 (SO 0349)	I	Fe	Main lens 2000 feet long by 31.3 feet wide contains 6500 tons per slope foot at grade of 32.77% Fe; 3 additional zones totaling 100 feet in length avg. 17%, 16.7% and 25.5% Fe, respectively	MDC 20 p104
Bessemer Deposit Mayo Township	MDI31F04SE-00012 (SO 0235)	I	Fe	No.4 deposit 2 480 819 tons @ 28.62% recoverable Fe	MDC 20 p110
Chilis Deposit Mayo Township	MDI31F04SE-00013 (SO 0236)	I	Fe	6 193 330 tons @ 19.25% recoverable Fe	MDC 20 p114
Calabogie Magnetite Property Algoma Ore Prop. Ltd. Bagot Township	MDI31F07SE-00009 (SO 0353)	I	Fe	Reserves of 45 million tons @ 25% Fe to 500 feet and 28% Fe to 1000 feet	MDC 11 p314
Buckhorn Deposit Bagot Township	MDI31F07NE-00069 (SO0362)	I	Mo	Largest of numerous small lenses contains 1500 tons @ 1% MoS_2	MDC 20 p132
Bannockburn (Madoc Mining Company Ltd.) Madoc Township	MDI31C12NE-00195 (SO 7274)	I	Au	225 000 T grading 0.267 oz/ton Au	MP 161 p377
Cooper Spruce Ridge Resources Ltd. Elzevir Township	MDI31C11SW-00044 (SO 2679)	I	Au, Talc	3 Mt @ 30-33% recoverable talc and 40 000 t @ 8 gpt Au	OFR 5945 p92 OFR 5808 p79
Dingman Deposit Deloro Minerals Ltd. Marmora Township	MDI31C12SE-00040 (SO 3590)	A	Au	7 Mt @ 1.8 gpt Au	OFR 5958 p11-13
Hawley Ram Petroleum Limited Olden Township	MDI31C10NW-00117 (SO 4057)	A	Wollastonite	2.5 Mt @ 32% wollastonite to a vertical depth of 75 m	OFR 5943 p337
Marmora Gitennes Exploration Inc. Marmora Township	MDI31C12SE-00096 (SO 3729)	I	Wollastonite	450 000 t (open pit) @ 47% wollastonite, plus 680 000 t @ 39% wollastonite in a separate zone	OFR 5715 p50
Trudeau C. Roger Young Hungerford Township	MDI31C11SW-00049 (SO 1192)	A	Calcite, Dolomite	4 Mt high-purity dolomite. No estimate available for calcite zone	OFR 5958 p11-11
Verona-Kirkham Stewart Lake Resources Inc. Bedford Township	MDI31C10SE-00023 (SO 1244)	I	Graphite	1.6 Mt grading 9.5% graphite in 2 separate zones	MDC 33 p16
Cal Graphite Corp. Butt Township	MDI31E11NE-00004 (N0129)	I	Graphite	Reserves of 60 Mt grading 3% graphitic carbon	MDC 33 p10
Globe Graphite Mine North Elmsley Township	MDI31C16SE-00016 (SO 1604)	I	Graphite	500 000 t of approximately 7% graphite below mined out portion, to the 300 feet level.	MDC 33 p25
St. Lawrence Pacific Coast Mines Inc. Pittsburgh Township	MDI31C08NW-00058 (SO 8487)	I	Wollastonite	9-11 Mt @ 43% wollastonite; 4-5 Mt @ 34% wollastonite	MNDM www 1997

** Table does not include nepheline syenite, trap rock, REE and dimension stone deposits.*

Table 11. Titanium, Tantalum, REE Occurrences Compiled from MDI-2 Database – Southern Regional Resident Geologist (Southeast).

Name	Township	MDI	Commodity	Deposit Status
Harrington, Marsh Ore Bed	Marmora	MDI31C05NE00135	Au, Fe, Ti	Occurrence
Green Island Rutile	Huntingdon	MDI31C06NW00088	Ti	Occurrence
Matthews, Newboro Lake	North Crosby	MDI31C09NW00009	Fe, Ti	Past Producer with Reserves
Chaffey	South Crosby	MDI31C09NW00011	Fe, Ti	Past Producer with Reserves
Tommy Lake	North Crosby	MDI31C09NW00131	Ti	Occurrence
Ricketts	Lake	MDI31C12NE00109	Fe, Ti	Occurrence
Orton	Tudor	MDI31C12NE00122	Fe, Ti	Past Producer w/o Reserves
Hastings Road Magnetite	Tudor	MDI31C12NE00185	Fe, Ti	Occurrence
Harold White, Twin Lake	Methuen	MDI31C12NW00114	Fe, Ti	Occurrence
Horse Lake, Tripp	Methuen	MDI31C12NW00127	Fe, Ti	Occurrence
Maloney	Marmora	MDI31C12SW00002	Cr, Cu, Fe, Ni, Ti	Past Producer w/o Reserves
Canadian Nickel	Methuen	MDI31C12SW00121	Ti	Occurrence
Ridgway	Marmora	MDI31C12SW00122	Cu, Fe, Ti	Occurrence
Jocko Lake	Limerick	MDI31C13NE00107	Fe, Ti	Occurrence
Umfraville	Wollaston	MDI31C13NW00057	Co, Fe, Phosphate, Ti	Occurrence
Canning Lake	Minden	MDI31D15NE00052	Fe, Ti	Occurrence
Pine Lake	Glamorgan	MDI31D16NW00215	Fe, Ni, Ti, V	Occurrence
Basin, Silver Crater (Basin)	Faraday	MDI31E01SE00054	Mica, Mo, Nb, Th, U, Ti	Past Producer w/o Reserves
Allen Lake	Harcourt	MDI31E01SE00306	Fe, Ti	Occurrence
Gal-Wood	Sabine	MDI31E08NE00010	Gd, Nb, Ta, Ti, U	Occurrence
Woodcox	Monteagle	MDI31F04NW00020	Ce, Feldspar, Nb, U, Ta, Th, Ti, Zircon	Past Producer w/o Reserves
Macdonald Mine	Monteagle	MDI31F04NW00023	Cu, Feldspar, Mo, Nb, REE, Th, Ti, U, Zircon	Past Producer w/o Reserves
Opeongo	Sebastopol	MDI31F06NE00093	Ag, Ce, Nb, Ta, Th, Ti, U, Y, Zircon	Occurrence
East Rockingham	Brudenell	MDI31F06NW00085	Au, Ti	Occurrence
South Lamberts	Griffith	MDI31F06SE00161	Ti	Occurrence
Horton Twp, Ottawa River	Horton	MDI31F10SE00019	Fe, Ti	Occurrence
Mahoney and Morin	Sabine	MDI31E08SE00002	Feldspar, Nb, REE, Ta, U	Past Producer w/o Reserves
Genesee No. 2 South	Monteagle	MDI31F04NW00018	Feldspar, Nb, Si, Ta, Th, U	Past Producer with Reserves
Plunkett, Plunkett South	Monteagle	MDI31F04NW00019	Ce, Feldspar, Amethyst, Mo, Nb, Th, Ta, U	Past Producer w/o Reserves

Name	Township	MDI	Commodity	Deposit Status
Dubbiestein	Bangor	MDI31F05SW00010	Nb, Ta, Th, U	Occurrence
Tooeys Lake, Tooley Lake	Brougham	MDI31F06SE00090	Nb, Ta, Th, U	Occurrence
Renfrew Minerals, Wal-Gem West Quarry	Lyndoch	MDI31F06SW00013	Be, Feldspar, Fluorite, Mo, Nb, REE, Si, Ta, Th, U, Zircon	Producing Mine
Barr Feldspar Quarry, Woermke	Fraser	MDI31F14SW00003	Ce, Feldspar, Nb, Ta, Th, U	Past Producer w/o Reserves
Quinn	Olden	MDI31C10NW00366	Cu, Ni, REE	Occurrence
Orser-Kraft	South Sherbrooke	MDI31C15SE00027	Feldspar, Nb, REE, Th, U	Past Producer w/o Reserves
Nobles Bay, Rogers, J.	North Burgess	MDI31C16SE00004	Mica, REE	Past Producer w/o Reserves
Maclaren, Willaim L.	North Burgess	MDI31C16SW00017	Mica, Phosphate, REE	Past Producer w/o Reserves
Christie Lake	South Sherbrooke	MDI31C16SW00142	Magnetite, Nb, REE	Occurrence
Drude South	Cavendish	MDI31D09NW00079	REE, Th, U	Occurrence
Copper Anomaly	Lutterworth	MDI31D15SE00151	Cu, REE, Sr, Zircon	Occurrence
Rare Earth Anomaly	Lutterworth	MDI31D15SE00152	Cu, REE, Sr, Zircon	Occurrence
North Rare Earth Anomaly	Lutterworth	MDI31D15SE00153	Cu, REE, Sr, Zircon	Occurrence
Laurencin, Milbol	Cardiff	MDI31D16NE00160	Mo, REE, Th, U	Occurrence
Mclennan, J.G.	Peck	MDI31E07NE00006	Nb, REE	Occurrence
Malcovitch, P.	Clyde	MDI31E08NW00003	Ce, REE, U	Occurrence
Gole, J.G.	Murchison	MDI31E09SE00004	Feldspar, Nb, REE, Si, U, Zircon	Past Producer w/o Reserves
Cameron and Aleck	Murchison	MDI31E09SE00005	Feldspar, Nb, REE	Past Producer w/o Reserves
D'Eldona, Yankee Dam	Butt	MDI31E11NE00070	Nb, REE, U	Occurrence
Plunkett North	Monteagle	MDI31F04NW00185	Feldspar, REE, U	Occurrence
Lake Clear	Sebastopol	MDI31F06NE00092	REE, Th, U	Occurrence
Price, E.C., Quadeville	Lyndoch	MDI31F06SW00014	Be, Feldspar, Fluorite, Nb, Phosphate, REE, Si, Th, U, Zircon	Producing Mine
Universal Light Metals	Lyndoch	MDI31F06SW00065	Be, Ce, Nb, REE, Th, U	Occurrence
Lake Property, Lake Mine	Dickens	MDI31F12SW00006	Feldspar, REE	Past Producer w/o Reserves

Note: MDI-2 database was queried for Ti, Ta and REE occurrences. This listing indicates the presence of the commodities, not necessarily their order of abundance. This list should be used as a preliminary guide. Hard copies of these complete MDI files are located at RG office in Tweed.

Table 12. Historic Production of Gold – Southern Regional Resident Geologist (Southeast).

Mine	Township	Operating	Tons Milled	Ounces Produced	Grade
Big Dipper	Barrie	1907, 1909	52	17	0.33
Cook	Marmora	1901, 1902, 1904	1 483	289	0.26
Cordova	Belmont	1892	120 670	22 774	0.19
Craig	Tudor	1905-1906	1 850	248	0.13
Deloro	Marmora	1897-1902	39 143	10 360	0.26
Gatling 5 Acre	Marmora	1900-1903	6 114	2 353	0.38
Gilmour	Grimsthorpe	1909-1910	550	172	0.31
Golden Fleece	Kaladar	1919, 1922	Unknown	480	Unknown
Ledyard	Belmont	1893-1894	55	13	0.24
Pearce	Marmora	1893, 1908	239	302	1.26
Sophia	Madoc	1900, 1941	1 800	110	0.06
Sovereign	Marmora	1878, 1891- 1892, 1900	Unknown 1 962	970 370	Unknown 0.19
Star of the East	Barrie	1905, 1907	976	134	0.14
		Total	174 894	38 592	

Table 13. Historic Production of Copper, Lead, Zinc – Southern Regional Resident Geologist (Southeast).

Mine	Twp.	Operating	Tons Milled	Production
Kingdon	Fitzroy	1884-1885, 1914-1931	905 000	76 821409 lbs Pb conc., 857 312 lbs Zn conc., 60 074 072 lbs Pb rec
Long Lake	Olden	1897-1925, 1973-1974	3442, NA	$41 550 ore value, 9467 tons Zn valued at $1 227 000
Eldorado Copper	Madoc	1906	NA	234 000 lbs copper matte containing 230 oz Au, 182 oz Ag, 109 000 lbs Cu
Hollandia Lead	Madoc	1903-1906	NA	2 653 365 lbs Pb

Table 14. Historic Production of Iron – Southern Regional Resident Geologist (Southeast).

Mine	Township	Operating	Tons Milled	Grade (% Fe)
Calabogie	Bagot	1883-1901	10 000	26
Martel	Bagot	Pre 1890	2 000	58.71
Williams (Black Bay)	Bagot	1880-1890	25 000	51.89
Black Lake	Bedford	1882-1884	4 000	40
Glendower	Bedford	1873-1895	50 000	50-60
Belmont (Ledyard)	Belmont	1899-1900, 1911-1913	8 433	51.2
Blairton	Belmont	1820-1875	300 000	51.8
Playfair (Dalhousie)	Dalhousie	1866-1871	11 100	57.6

Mine	Township	Operating	Tons Milled	Grade (% Fe)
Radnor	Grattan	1901-1907	18 824	47.5
Eagle Lake (Blessington)	Hinchinbrooke	1887-1891	700	65.55
Tomahawk (Mag-Iron)	Lake	1947, 1950-1957	2 096	50.9
Wilbur	Lavant	Pre 1900, 1907-1908	146 892	56.69
Magnetawan	Lount	1910-1912	6 000	59.55
Paxton	Lutterworth	Before 1910	1 000	NA
Miller	Madoc	1899	6 823	NA
Wallbridge	Madoc	1900-1901, 1919, 1921	3 421	NA
Marmoraton	Marmora	1952-1978	28 000 000	40
Bessemer	Mayo	1902-1913	99 613	42.18
Childs	Mayo	1913	9 649	38.7
McNab	McNab	1873-1874	15 000	68
Robertsville & Mary	Palmerston	1895, 1900-1901, 1918-1919	13 477	70.5
Fournier	S. Sherbrooke	1873	600	60
Howland	Snowdon	1880-1882	1 500	58
Victoria	Snowdon	1882	?	58.35
Dog Lake	Storrington	1899	600	51.12
St. Charles	Tudor	1900-1902	5 186	57-60
Coe Hill	Wollaston	1884-1914	100 000	51.4
Total			28 841 914	

Table 15. Historic Production of Fluorite in the Southern Regional Resident Geologist District.

Mine	MDI Number	Township	Operating	Total Production (Tons)
Bailey	31C06NW00003	Madoc	1907, 1916, 1917, 1944-1950	25 000
Blakely	31C06NW00019	Huntingdon	1918-1920, 1928, 1941-1947	5 026
Coe	31C06NW00008	Huntingdon	1941-1942	114
Dwyer	31E01SE00091	Cardiff	1918-1920, 1943, 1944	97
Herrington South	31C05NE00009	Huntingdon	1917	13
Howard, Fred Hill	31C06NW00014	Huntingdon	1918, 1920, 1929, 1940-1942, 1944	2 500
Johnston	31C06NW00013	Huntingdon	1943, 1944-1947, 1949	187
Keene	31C06NW00004	Huntingdon	1918-19, 1943, 1944, 1950	5 000
Kilpatrick	31C06NW00005	Huntingdon	1944, 1953-1959	11 566
Lee Junior	31C05NE00008	Madoc	1917, 1940, 1943-1945	2 000
Lee Senior	31C05NE00006	Madoc	1916-1918, 1942, 1943	1 600
McIlroy	31C05NE00003	Madoc	1917-1918, 1923, 1944	540
Miller	31C05NE00005	Madoc	1917-1919	460

Mine	MDI Number	Township	Operating	Total Production (Tons)
Noyes	31C06NW00011	Huntingdon	1917-1920, 1941-1943	25 000
Palmateer	31C06NW00016	Huntingdon	1942	44
Perry	31C06NW00009	Huntingdon	1915-1920, 1941-1943	8 000
Perry Lake	31C06NW00007	Huntingdon	1910, 1913, 1915, 1917, 1952, 1960	4 000
Ponton	31C05NE00004	Madoc	1929-1942	1 500
Rogers	31C06NW00018	Huntingdon	1909-1914, 1943-1951	45 000
Rooks	31C12SE00003	Madoc	1916-1918	100
South Reynolds	31C06NW00010	Huntingdon	1917-1918, 1943	100
Wallbridge & Herrington	31C05NE00007	Madoc	1920-1922, 1941-1943	6 600
William Reynolds	31C12SE00002	Madoc	1941-1942	88

Fluorspar, a commercial fluorite product, is used as a flux in the making of steel and ceramics, as a constituent in the electrolytic process of making aluminum and in the production of hydrofluoric acid (HF). During World War II, a Canadian Government assistance program, in the form of loans and drill hole explorations stimulated development of the Madoc deposits (G. Guillet, 1964, IMR 12, p.1).

OGS ACTIVITIES AND RESEARCH BY OTHERS

There were no Ontario Geological Survey field projects in southeastern Ontario in 2000. For a listing of Ontario Geological Survey Publications in 1999 related to the District, please refer to Table 16.

Operation Treasure Hunt - Industrial Mineral Project

The consulting firm of Watts, Griffis and McOuat was the successful bidder in a call for proposals to assess the potential of white mica in southern and central Ontario. The project included field and laboratory examination of known deposits and a detailed market study. Maps, reports and databases will be published in 2001.

Table 16. Publications of Ontario Geological Survey 2000 – Southern Regional Resident Geologist (Southeast).

Title	Author	Type and Year of Publication
Aggregate Resources Inventory of Victoria County	Geomatics International Limited and Rowell, D.J.	OGS, Aggregate Resources Inventory Paper 168, 2000
Sand and Gravel Resources of Victoria County - North Half of the County (Townships of Dalton, Laxton, Digby and Longford, Carden, Bexley and Somerville)	Geomatics International Limited and Rowell, D.J.	OGS, Aggregate Resources Inventory Map 168-1A, scale 1:50 000, 2000
Sand and Gravel Resources of Victoria County - South Half of the County (Townships of Eldon, Fenelon, Verulam, Mariposa, Ops, Emily, Manvers)	Geomatics International Limited and Rowell, D.J.	OGS, Aggregate Resources Inventory Map 168-1B, scale 1:50 000, 2000
Bedrock and Resources of Victoria County - North Half of the County (Townships of Dalton, Laxton, Digby and Longford, Carden, Bexley and Somerville)	Geomatics International Limited and Rowell, D.J.	OGS, Aggregate Resources Inventory Map 168-2A, scale 1:50 000, 2000

Title	Author	Type and Year of Publication
Bedrock Resources of Victoria County - South Half of the County (Townships of Eldon, Fenelon, Verulam, Mariposa, Ops, Emily, Manvers)	Geomatics International Limited and Rowell, D.J.	OGS, Aggregate Resources Inventory Map 168-2B, scale 1:50 000, 2000
Report of Activities 1999, Resident Geologist Program, Southern Ontario Resident Geologist Report: Southeastern and Southwestern Districts, Mines and Minerals Information Centre and Petroleum Resources Centre	Sangster, P.J., McGuinty, W.J., Papertzian, V.C., Steele, K.G., Lee, C.R., Laidlaw, D.A. and Carter, T.R.	OGS, Open File Report 6008, 2000
Paleozoic Geology of the Northern Lake Simcoe Area, South-Central Ontario	Armstrong, D.K.	OGS, Open File Report 6011, 2000
Mines and Wines: Industrial Minerals, Geology and Wineries of the Niagara Region - Field Trip Guidebook	Steele, K.G. and Haynes, S.J.	OGS, Open File Report 6029, 2000
Precambrian Geology, Coe Hill Area*	Lumbers, S.B. and Vertolli, V.M.	OGS, Preliminary Map p.3403, scale 1:50 000, 2000
Precambrian Geology, Burleigh Falls Area*	Lumbers, S.B. and Vertolli, V.M.	OGS, Preliminary Map P.3404, scale 1:50 000, 2000
Precambrian Geology, Gooderham Area*	Lumbers, S.B. and Vertolli, V.M.	OGS, Preliminary Map P.3405, scale 1:50 000, 2000
Precambrian Geology, Campbellford Area*	Lumbers, S.B. and Vertolli, V.M.	OGS, Preliminary Map P.3406, scale 1:50 000, 2000
Precambrian Geology, Orillia Area*	Lumbers, S.B. and Vertolli, V.M.	OGS, Preliminary Map P.3407, scale 1:50 000, 2000
Precambrian Geology, Elmvale Area*	Lumbers, S.B. and Vertolli, V.M.	OGS, Preliminary Map P.3408, scale 1:50 000, 2000
Precambrian Geology, Gravenhurst Area*	Lumbers, S.B., Vertolli, V.M., Schwerdtner, W.M.	OGS, Preliminary Map P.3409, scale 1:50 000, 2000
Precambrian Geology, Bracebridge Area*	Lumbers, S.B. and Vertolli, V.M.	OGS, Preliminary Map P.3411, scale 1:50 000, 2000

* *These maps are part of a series of 15 maps (Maps P.3402 to P.3416) that detail the Precambrian geology of the Bancroft and Huntsville areas. Mapping was conducted by S.B. Lumbers in conjunction with the Royal Ontario Museum 1989 -1993.*

Geological Survey of Canada, National Earthquake Hazards Program

Janet Drysdale, a seismologist with the National Earthquake Hazards Program of the Geological Survey of Canada, set up a seismograph south of Madoc after a number of small earthquakes were felt by residents of the area. Data were recorded from October to mid-December. Seismic risk to southern Ontario may be considered to be a significant social and economic issue. In 2001, as part of the Polaris (Portable Observatories for Lithospheric Analysis and Research Investigating Seismicity) Project, 30 seismographs will be installed in the southern Ontario region, roughly from Ottawa to Windsor and from Niagara to Georgian Bay. This array will provide greatly improved definition of the spatial and depth distribution of earthquakes and their occurrence rates, as well as acquire an improved understanding of the architecture of the Precambrian basement for southern Ontario. (Janet Drysdale, Geological Survey of Canada, personal communication, January 2001)

Petrography and Mineralogy of an Ultrabasic Dyke of Kimberlitic Affinity at Varty Lake, Ontario

Mandy Sarfi is completing an honors thesis project at Carleton University on the petrography and mineralogy of an ultrabasic dyke of kimberlitic affinity at Varty Lake, Ontario.

A table showing petrographic observation has been completed. The table includes all identified primary and secondary minerals and textural descriptions. Based on the table, 3 samples have been selected for further study. Samples MS-S2 and MS-S1 will be studied using the Scanning Electron Microscope (SEM) for quantitative EDS analysis. These 2 samples were selected as being representative of the 12 sections examined and are also the least altered. The freshest samples are required to eliminate mineral and reactions that may have occurred during late stage deuteric alteration. In addition, sample MS-M1 has been selected since there is a possibility that it contains the mineral melilite. This would indicate that the Varty dyke is not a bona fide kimberlite, if confirmed to be present in the sample. A sample donated by Dr. A.N. LeCheminant from the Varty Lake Dyke will also be examined on the SEM, if time permits, since there is a possibility of melilite also occurring in this thin section. (M. Sarfi, personal communication, January 2001)

Abandoned Mines Site Assessment Survey

In June 2000, a Request for Tender was issued for the Site Assessment of all Abandoned Mines within Ontario and was comprised of 9 individual projects that encompassed 3681 sites. This tender was issued in order to complete the site assessments of abandoned mines project that operated between 1991 to 1994. The new tender would provide accurate assessment reports, detailing mine features/hazards, on all known abandoned mine sites in Ontario. The Southeast District was divided into Tweed east and west areas. The numbers of sites within the District currently recorded in the Abandoned Mines Information System (AMIS) database are 925 and 733, respectively. The projects were to be completed by the beginning of December. An additional 15 townships, surveyed by a previous contractor, were added to the Tweed West contract. Completion date for this project was mid-January.

The Lacey Mica minesite, located in concession 7, lots 10 and 11, Loughborough Township was rehabilitated in early spring, 2000. All of the work was completed by the end of April except for the placement of 2 concrete shaft caps. These were completed at a later date when road conditions allowed for the movement of heavy vehicles. A total of 3 shafts, 1 large pit, 5 smaller pits, and 2 addits were filled, sloped or blocked. The 3 shafts, ranging in depth from 185 feet to 30 feet, were back-filled with material from the site. The main pit measured 100 feet x 200 feet and was approximately 70 feet deep.

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Ontario

Ontario Geological Survey
Regional Resident Geologist Program

Southern Ontario Regional Resident Geologist
(Southwest Ontario District)--2000

by

K.G. Steele

2001

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SOUTHERN ONTARIO REGIONAL RESIDENT GEOLOGIST (SOUTHWEST ONTARIO DISTRICT)--2000

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INTRODUCTION

In 2000, the mining and quarrying of minerals in the Southwest Ontario District was estimated at $1.25 billion of production. Four mines, 37 quarries and 3 brine well fields extracted industrial minerals, non-aggregate stone and building stone throughout the year. The demand for clay brick was very strong. Both Canada Brick and Brampton Brick made significant progress in increasing production capacity. In 2000, the OGS commenced a project to map Queenston shale resources for the brick industry.

Recommendations are presented for the exploration of landscaping/dimension stone in the Wiarton and Orillia areas. Exploration and development opportunities exist for cement grade limestone, high-quality aggregate, high-purity limestone, high-purity dolostone, engineering stone, salt, gypsum, silica, and brick quality shale across southwest Ontario. The importance of nearby markets and ease of transporting product via vessel, train or truck is highlighted.

MINING ACTIVITY

All mineral production in the Southwest Ontario District comes from industrial minerals. In 2000, the mining and quarrying of industrial minerals in the Southwest Ontario District resulted in approximately $1.25 billion of production or 25% of Ontario's overall mineral production. All of the province's salt and gypsum production, almost all of the clay/shale products and lime production, as well as a large percentage of the cement, sand and gravel, and stone production comes from the Southwest Ontario District. The total value of Ontario's industrial mineral production in 1999 (the last year for which statistics are available) was $1.83 billion, or 36% of the total value of mineral production in the province (see Table 1).

The locations of all active mineral extraction operations in southwest Ontario are shown on Figure 1. The mines, quarries and brine well fields listed extract a variety of commodities for numerous end products, including salt (road salt, chemicals), gypsum (wallboard), limestone (lime, cement) shale (cement, bricks), dolostone (chemicals, building stone), and sandstone and gneiss (building stone). Operations that extract construction aggregate or petroleum products are not included.

Production figures for the 2 underground salt mines and 2 underground gypsum mines operating in the Southwest Ontario District are listed in Table 2.

A significant portion of Canada's aggregates industry is situated in Southwest Ontario District. According to *Aggregates & Roadbuilding* (May-June 2000), nine of the country's top 20 quarries are found within the District, including Dufferin Aggregate's Milton Quarry, the country's largest aggregate operation with 5.76 million tonnes of material extracted in 1999. These 9 quarries produced a total of 19.5 million tonnes. Similarly, 10 of the country's top 20 sand and gravel operations occur in the Southwest Ontario District (*Aggregates & Roadbuilding*, July-August 2000), including number 2 – TRT Aggregates' Mosport Pit and number 3 – Lafarge Canada's Stouffville Pit, both operate on the Oak Ridges Moraine, northeast of Toronto.

All of the province's oil and gas production comes from southwest Ontario. Ontario's oil patch is benefiting from growth spurred by strong energy prices. Annual production is approximately 15 billion cubic feet of gas and 1.5 million barrels of crude. There are 60 to 70 oil and gas producers operating in Ontario, with Talisman Energy by far the largest player. Talisman has approximately 500 operating gas wells under Lake Erie. In total, there are approximately 1200 gas wells and 1100 oil wells producing in Ontario.

Producers/Recent Developments

Salt

In 2000, three companies extracted salt in Ontario, all within the Southwest Ontario District (Figure 1). Sifto Canada Inc., located at Goderich and The Canadian Salt Company Limited, located in south Windsor operate both rock salt mines and brine well fields. General Chemical Canada Limited operates Ontario's largest brine well field, south of Windsor near Amherstburg.

Rock salt production for use as road salt was reduced from previous years due to lower demand related to a series of mild winters with limited snowfall in the Great Lakes region (Table 2). Abundant snowfall during the first half of the winter of 2000-2001 has resulted in depleted road salt stockpiles. It is expected that 2001 production from both rock salt mines will be at or above 2000 levels. In the past year, salt from brine production remained at or close to plant capacities.

Throughout 2000, IMC Global, the parent company of Sifto Canada Inc. was exploring options to divest its US$322m/yr salt business through sale or joint venture. The company wants to strengthen its core phosphate and potash businesses. IMC Global acquired the salt assets through the purchase of Harris Chemicals in 1999. As of the January 2001, no changes in ownership or partnership agreements had been announced.

In August 2000, Environment Canada released results from a 5-year scientific assessment that concluded road salt is toxic to the environment. Under Canada's Environmental Protection Act, the federal government has 2 years to develop control measures for substances found to be toxic, and a further 18 months for their implementation. The assessment found that 4.75 million tonnes of sodium chloride and 108 000 tonnes of calcium chloride are spread on roads every year in Canada.

In December 2000, General Chemical Canada Limited announced plans to place its 500 000 tons per year synthetic soda ash plant in Amherstburg on care and maintenance. The plant, one of only two synthetic facilities still operating in North America is scheduled to cease production in March 2001. The company plans to continue manufacturing calcium chloride in Amherstburg, but will extract it directly from brine rather than as a co-product of soda ash production. The capacity will remain at 450 000 tons/year of liquid and flake products (*Industrial Specialties News*, Volume 14, Number 23).

Gypsum

In 2000, gypsum was mined at 2 locations in Ontario; at Caledonia by Georgia-Pacific Canada Inc. and at Hagersville by CGC Inc. Both operations have on-site wallboard manufacturing facilities. BPB Westroc Inc. operates a wallboard facility in Mississauga, Ontario using flue gas desulphurization gypsum supplied by Ontario Power Generation and other sources. All gypsum mines and wallboard manufacturing operations are within the Southwest Ontario District (Figure 1).

Total gypsum production in 2000 was reduced from previous years (Table 2) due to the oversupply of wallboard in the US market. Expansions by a number of US producers and an easing of demand have dramatically changed the US wallboard market over the past year. The US wallboard industry has gone from operating at full capacity and enjoying high product prices to surplus capacity and much lower product prices. Ontario exports of wallboard to the

US market have decreased significantly. In Canada, particularly in southern Ontario, the demand for wallboard remains strong.

In 2000, Georgia-Pacific Canada's Caledonia No. 3 Mine continued a program of capital improvements including operation of a new ventilation shaft, commissioning of a third continuous mining machine and replacement of the belt on the 4300 m main haulage conveyor.

CGC Inc.'s Hagersville Wallboard Plant continued to operate at capacity using a blend of raw materials, 17% synthetic gypsum from flue gas desulphurization scrubbing and 83% gypsum from the on-site underground mine.

In June 2000, BPB of England acquired the Celotex wallboard and ceiling tile business of the US. Prior to the acquisition, BPB the second largest producer of wallboard in the world was dominantly in Europe and had no US presence. BPB Westroc Inc., BPB's Canadian subsidiary operates six wallboard plants, including the Mississauga Ontario plant, and two gypsum mines. When Celotex is integrated under Westroc, it will establish BPB Westroc as the fourth largest producer in North America, a region representing more than 50% of the world demand.

During 2000, profitability of the North American wallboard industry took a hit from higher paper and energy costs. Ontario wallboard plants use natural gas fired kilns.

Cement

Five cement plants and three limestone source rock quarries are located in the Southwest Ontario District. Blue Circle Cement operates quarry and cement plant complexes at Bowmanville and St. Marys. Lafarge Canada Inc. operates a quarry and cement plant near Woodstock. Along the Lake Ontario shoreline immediately west of Toronto is the St. Lawrence Cement Inc. Mississauga cement plant and adjacent shale quarry. Limestone is shipped to this plant from the Ogden Point quarry in south central Ontario. Federal White Cement Ltd. operates a specialized product cement plant near Woodstock; the limestone raw material is purchased from a local quarry.

Cement production levels remained high in 2000 due to the continuing robust demand in the Ontario and US Great Lakes markets. Cement sales volumes increased, with most plants being able to sell their entire production. Demand for product is at its highest level in over a decade. Total cement production from Southwest Ontario District plants is conservatively estimated at 5 million tonnes.

Strong market demand is expected to continue into 2001, particularly in the southern Ontario area. According to the Cement Association of Canada's cement industry projections, the total market demand in the areas served by southern Ontario facilities is about 8 million tonnes. All plants are undertaking continuous technology and equipment upgrades to meet increased demand.

Even though sales volumes were high in 2000, there was a reduction in cement profitability. Higher energy costs for the production and distribution of product contributed to the lower profits.

In 2000, the top corporate news story in the cement industry was the on again, off again, takeover bid by French building materials company Lafarge SA for British cement producer Blue Circle Industries PLC. Early in 2000, Lafarge made a US $5.6 M unsolicited bid for Blue Circle, who immediately rejected the offer. The merger, if successful, would create the world's largest cement manufacturing entity. By May, the Lafarge bid was deemed unsuccessful.

However, in January 2001, Blue Circle agreed to a takeover deal from Lafarge for US $6.2 M. The takeover will give Lafarge approximately 60% of the Ontario cement market and bring four of the province's six primary cement plants under one owner. The Canadian Competition Bureau, who reviewed the previous takeover bid, will require Lafarge to divest Blue Circle assets. Lafarge has indicated it will dispose of Blue Circle's Canadian operations, which employ about 2,000 people in Ontario.

Clay/Shale Products

In 2000, four companies extracted shale at 7 quarries in southwest Ontario for heavy clay products. The shale supplied 5 brick and tile manufacturing operations within the District. In 2000, approximately 537 million brick units were produced at plants with the Southwest Ontario District, a significant increase over the previous year. This represents 93 % of Ontario's production.

The demand for clay bricks was extremely strong in 2000, particularly across southern Ontario. The following newspaper quote illustrated the market; "The shortage of bricks means that Heathwood Homes has to take delivery whenever there is a shipment available, whether the builder is ready for them or not. Brick manufacturers ask builders to estimate the number of bricks they will need to cover their construction projects for the year. The demand for new housing has been unexpectedly fierce this year, and Brampton Brick and Canada Brick, the two large manufacturers for Toronto builders, both sold out their entire production in the first week of 2000" (*National Post*, September 23, 2000).

Two large operators, Canada Brick and Brampton Brick, have both quarrying and manufacturing facilities in southwest Ontario. One smaller operator, Century Brick, also has both quarrying and manufacturing facilities. A small quarry operated by George Coultis & Son Ltd. near Thedford, Ontario, supplied shale to Paisley Brick and Tile Co. Queenston shale is extracted from the quarries operated by Canada Brick, Brampton Brick and Century Brick, whereas Arkona Formation shale forms the resource rock at the Thedford Quarry.

In 2000, Canada Brick quarried shale at their Streetsville, Milton, Burlington and Aldershot quarries located between Toronto and Hamilton. Canada Brick currently operates 3 large brick plants, one beside the Streetsville Quarry and two adjacent to the Burlington Quarry. The company is nearing completion of a new brick plant that will produce 150 million bricks per year at the Aldershot Quarry (see Advanced Exploration and Development). With this expansion Canada Brick will have a production capacity of approximately 460 million brick units per year from their plants in the Southwest Ontario District. Due to strong market demand, all plants operated at capacity in 2000. The company is planning to operate all plants at full capacity in 2001.

Brampton Brick Ltd. currently trucks shale from their Cheltanham Quarry a distance of 10 km to their brick plant in northwest Brampton. In 2000, the plant operated at 133% of capacity and produced over 200 million bricks (personal communication, Claudio Sacilotto, January 2001). In 1999, the company began a $35 million plant expansion, including the installation of a third kiln. Once the expanded plant is fully operational in early 2001, production capacity will have increased by 50%. The 400,000 square foot plant will be the single largest clay brick production facility in North America. Jeffery G. Kerbel, Brampton Brick's President and Chief Executive Officer stated that the expansion is a welcome development in the current robust market (www.bramptonbrick.com, January 2001).

As of April 2000, Century Brick Ltd. purchased the Georgetown Shale Quarry of A. C. Martin Limited. Century Brick had previously purchased the clay brick manufacturing facilities of the Hamilton Brick Limited. The Century Brick plant operates with a capacity of producing 16 million bricks per year.

To contrast the positive market news, a significant issue for the brick industry is the rapidly shrinking resource area of Queenston shale, the primary source material for the brick industry. The main area of accessible and exploitable Queenston Formation is a narrow, wedge-shaped area located immediately east of the Niagara Escarpment extending from north Brampton to the Mississauga and Hamilton areas. Much of this area is or is quickly becoming urbanized.

Chemical, Metallurgical & Filler Limestone and Dolostone Products

Except for a small amount of production in northern Ontario that utilizes imported materials, Ontario's lime industry is situated in the Southwest Ontario District. Within the District, 4 quarrying operations extract limestone or

dolostone for use in the lime, chemical, metallurgical and filler products industries. Some of these and other quarrying operations also sell material for aglime, aggregate, landscaping and engineering uses. Beachville Lime Ltd. produces high-calcium lime from the Devonian Lucas Formation; Dundas Lime Ltd. and Guelph Lime Ltd. produce dolomitic lime from the Silurian Guelph Formation; and E.C. King Contracting extracts glass-grade dolomitic lime from the Silurian Amabel Formation. The Dundas Lime Ltd. plant purchases rock from the adjacent Dundas Quarry of Lafarge Canada Inc.

A major development in the industry in 1999 was the consolidation of Ontario's four largest operations within the Carmeuse North America Group. A joint venture was completed between Carmeuse North America (Guelph DoLime Ltd. and BeachviLime Ltd.) and Lafarge Lime (Dundas Plant), and Global Stone Ingersoll Ltd. was sold to Carmeuse North America. At the end of this consolidation process, each of the operations received corporate name changes to Guelph Lime Ltd., Beachville Lime Ltd. (former BeachviLime Ltd. and Ingersoll Lime Ltd.), and Dundas Lime Ltd. The joint venture now has 18 plants, including 4 in southwest Ontario, with production capacity of 9 million tonnes per year, which accounts for 32% of the North American lime production capacity.

In December 2000, Lafarge sold its Specialty Products Division but retained its lime business, which includes a 40% interest in the Carmeuse North America Group.

In 2000, Beachville Lime Ltd. continued to integrate all facilities on the Beachville-Ingersoll site into one operation. In this process, the West (south) Quarry, formerly the Ingersoll Quarry, was closed in June 2000; work on the West (north) Quarry, formerly the Millennium Quarry, was suspended; and the West Plant was shut during the summer of 2000. By year-end the integration was 90% complete. All limestone production is currently from the Centre Quarry, formerly the Beachville West Quarry. In 2000, over 2 million tonnes of limestone was extracted to supply the Centre and East Plants (*North American Mineral News*, December 2000).

Dolostone quarried at Guelph by Guelph Lime Ltd. is trucked to both Dundas and Beachville for processing.

E.C. King Contracting operates the Sydenham Quarry near Owen Sound. In 2000, over 21 000 tonnes of dolostone was shipped to the company's dolomite plant, where it was used to produce glass grade dolomite, fertilizer diluent, aglime and coarse mineral fillers (personal communication, Frank McDonald, January 2001). In 2000, the company started phase II quarry operations at the Sydenham Quarry.

As previously noted, General Chemical Canada Inc. operates a chemical plant at Amherstburg. As part of this operation the company owned and operated the nearby McGregor Quarry. The quarry contains chemical grade limestone from the Lucas Formation, however for the past few years, including 2000, most material extracted was for construction aggregate use. In November 2000, General Chemical sold the McGregor Quarry to Amherst Quarries Ltd., a local construction company that plans to operate it for aggregate production.

The significant increase in natural gas prices in 2000 is causing problems in the lime industry. The high cost of natural gas is adding to the problem of weakening markets for operators of gas-fired lime kilns. Carmeuse North America Group has 2 gas-fired kilns operating in Ontario that supply major customers in the steel industry. However, where freight charges permit, the company is supplementing local production with product shipped from its other plants. All of Carmeuse's US plants are now using energy sources other than natural gas.

Dimension/Building Stone

In 2000, twenty-one quarries in the Southwest Ontario District extracted material for dimension, building and landscape stone uses. A limited number of these quarries also extracted stone that was crushed and used as aggregate. The quantity of dimension and building stone quarried increased from the previous year.

Most stone quarry operators indicated that the demand for stone outstripped supply in 2000; particularly those supplying Eramosa Dolostone/Marble and Whirlpool Sandstone as landscape materials. Many of these operators expect the under-supply situation to continue through 2001. Several quarry operators report that all production for

some products to be produced during 2001 is already sold out. The primary market for stone is the Great Lakes region of Canada and the US, with a limited amount being shipped further a field.

The largest concentration of stone producers in the Southwest Ontario District is in the Wiarton area where 12 current operations extracted Eramosa Member dolostone for building stone, landscaping and flag stone markets. Owen Sound Ledgerock Ltd., the largest stone quarrying and processing operation in the District, cut and polished Eramosa Member material for dimension and building stone uses using over 65 large format stone cutting machines.

Arriscraft International Inc. operated the Adair Marble Quarry just north of Wiarton. Blocks of the Wiarton/Colpoy Bay Member of the Amabel Formation are extracted and either processed on-site or transported to the company's Cambridge plant. In 2000, Adair Marble was used as facing stone on a building at the Royal Military College in Kingston.

In the Georgetown-Inglewood area, white and maroon Whirlpool Formation sandstone was extracted at the Rice & McHarg, Hilltop Stone and Supply, and Deforest Brothers quarries for the production of squared and irregularly shaped landscaping stone.

In the Orillia area, Gull River Formation limestone was extracted by three separate companies; Speiran Quarries Ltd., Cut Above Natural Stone, and Stone Cottage Inn Ltd. for sale as building and landscape stone. Also in the Orillia area at the Rama Stone Quarries Ltd. property, gneiss was quarried for landscape stone and crushed for premium-quality aggregate.

ADVANCED EXPLORATION & DEVELOPMENT

Dimension/Landscape Stone

Several dimension/building stone projects licensed under the Aggregate Resources Act are at the advanced exploration and/or development stage within the Southwest Ontario District. For reasons of legal privacy and confidentiality, the companies and individuals working on these projects and their locations can not be identified. The projects include applications for new quarry licenses, applications for expansion of existing quarry licenses, and applications for re-zoning. It is anticipated that at least two of these projects will be in production in 2001.

Greenock High Calcium Limestone Quarry

Formosa Environmental Aggregates Ltd., a company partially owned and managed by Fortune Minerals Ltd., owns approximately 120 ha in the municipality of Brockton in southern Bruce County. The property hosts a resource of approximately 15 million tonnes of high-calcium limestone grading 99% calcium carbonate. The company is in the final stages of permitting the property under the Aggregate Resources Act to develop various products for the chemical, agricultural, environmental and construction industries.

The resource is hosted in the Formosa Reef Limestone, part of the Amherstburg Formation of the Detroit River Group. The limestone, deposited as a series of Middle Devonian patch reefs developed on the eastern margin of the Michigan Basin, is comprised of stromatoporoid and coral boundstones with bioclastic grainstones produced by reef dwelling organisms and locally interlayered micritic mudstone.

The property is zoned for mineral extraction under the local and county land use plans. A February 2000 Ontario Municipal Board hearing resulted in an October 2000 decision to allow licencing under the Aggregate Resources Act once fish habitat issues are addressed to the satisfaction of the Department of Fisheries and Oceans.

Aldershot Shale Quarry and Brick Plant

As previously reported, in 1998 Canada Brick began developing the new Aldershot West Quarry and an on-site brick plant with capacity to produce 150 million brick units per year. Canada Brick is investing $51 million to set up the new facility. During 1998 and 1999, the quarry was opened and plant site was prepared. In the summer of 1999, footings were poured for the 25 000 m^3 brick plant and building construction was underway. As of the end of 2000, the building was complete with most equipment installed and the plant is expected to produce bricks in the spring of 2001. The plant will operate at full capacity once production starts to meet the current demand for bricks.

EXPLORATION ACTIVITY

All exploration activity in the Southwest Ontario District occurs on private land and there is no requirement for companies or individuals conducting mineral exploration to file assessment reports with the Ministry of Northern Development and Mines or to contact the District Geologist. Through informal discussions however, staff of the Southwest Ontario District Geologist Office are kept apprised of most exploration or property acquisition interests for such commodities as: high-purity limestone/dolostone, salt, gypsum, sandstone, limestone/dolostone/marble, dimension/ building stone, cement, and shale. Numerous companies and individuals contacted the Southwest Ontario District Geologist Office throughout 2000 for information and/or advice with respect to exploration areas, commodities, exploration methods, processes for acquiring mineral properties and exploration opportunities. Confidentiality and private land issues surrounding the competitive and market-driven nature of the industrial minerals industry impedes the disclosure of the identities of companies and individuals exploring in southwest Ontario and/or the locations of their properties. However, most exploration centres on the commodities currently experiencing strong market conditions, including aggregate, cement, dimension/building stone and shale/brick.

RESIDENT GEOLOGIST PROGRAM STAFF AND ACTIVITIES

The Southwest Ontario District Geologist Office, staffed by the District Geologist and the District Support Geologist, operates from the Mines and Minerals Information Centre (MMIC) in Toronto. All files, mineral deposit records and reference materials for Southwest Ontario District are available for viewing at MMIC. In 2000, the District Geologist was Ken Steele. Heather Macdonald filled the District Support Geologist position from January through March, followed by Jennifer Stewart from mid April through mid September. The position was vacant from mid September through to he end of the year. Pascale Sergerie provided summer assistance under the Ontario-Quebec summer student exchange program.

In 2000, staff continued updating mineral deposit inventory (MDI) files for the Southwest Ontario District. By year-end, approximately 50 files had been updated.

A mapping of Queenston Shale project recommended by the District Geologist and supported by the brick industry commenced in June. Derek Armstrong, a staff member of the Sedimentary Geoscience Section of OGS is mapping and geochemically sampling the Queenston Shale, concentrating on the Burlington to Brampton area. The District Geologist arranged meetings with all Ontario brick producers, Canada Brick, Brampton Brick and Century Brick, to introduce the project. The Burlington, Cheltenham and Georgetown quarries were visited and tours of the Burlington and Brampton brick plants were arranged. Additional logistical support provided by District staff included: acquiring land use planning documents; researching drilling methods; writing, editing and evaluating drilling tender; planning and securing access to drill sites; and on-going communications with brick producers.

Staff responded to a wide variety of inquires throughout the year, the most frequent requests for information focused on the following southern Ontario topics: Eramosa marble/dolostone building and landscape stone; the Oak Ridges Moraine; the Aggregate Resources Act; the Rockfort quarry proposal; shale resources; aggregate resources; building

stone opportunities; land use planning; fossils; geology of Toronto; limestone; and mineral samples.

Property Examinations

In 2000, the focus of site visits in Southwest Ontario District was four-fold: 1) to continue to increase familiarity with all mineral industry players within the District by focusing on their resources, operations and issues; 2) to visit prospective, proposed or developing mineral properties; 3) to investigate mineral sites with current or potential land-use conflicts; and 4) to acquire information for subsequent field trip visits.

There are 44 industrial mineral operations and approximately 40 aggregate quarries active in Southwest Ontario. During 2000, the District Geologist made contact with almost all industrial mineral producers and visited 13 of their extraction and processing sites. In total, 40 site visits were conducted throughout the year (see Table 3). Site visits included 2 underground mine tours, investigations at 27 quarries, tours of 7 industrial mineral processing plants, and reconnaissance at prospects for aggregate, building stone and vermiculite. Site visits provided information on commodities, mineral deposits, local and regional geology, extraction techniques, processing, products, markets, production and economic statistics, and issues.

The District Geologist was provided a comprehensive geology and/or plant processing tours at:

- Hagersville Mine
- Goderich Mine
- Vineland Quarries
- Beachville Centre Quarry
- Milton Quarry (Dufferin Aggregates)
- Tatlock Quarry
- Attia Quarry
- Speiran Quarry
- Cut Above Natural Stone Quarry
- A & A Natural Stone Quarry
- Canada Brick Burlington Brick Plant
- Brampton Brick Plant
- Georgia-Pacific Canada Caledonia Wallboard Plant

Mine, quarry, property and site visits are all part of the Resident Geologist Program's on-going responsibilities to monitor current mineral activities, to document known mineral deposits and occurrences, and to identify areas of high mineral potential. Site visits also provide useful information for application to land use planning processes.

Field Trips & Publications

In May, the District Geologist and District Support Geologist hosted a field trip to 3 sites in the Owen Sound-Collingwood area for 2 University of Saskatchewan graduate students. The visits provided a regional context to Lukasz Skublicki who is investigating the Amabel Formation in the Burlington - Acton area.

The District Geologist on September 9th lead a field trip "Industrial Minerals, Geology and Wineries of the Niagara region" for 12 members of the National Geological Surveys Committee. Geological overviews of the Niagara Escarpment were provided at Niagara Falls, Niagara Gorge, Locust Grove-Queenston, and Ball's Falls. Brief site visits were made to shale/brick and dolostone/aggregate quarries.

In September, the District Geologist organized a field trip to Dufferin Aggregates' Milton Quarry for Resident Geologist Program staff. Dufferin Aggregates geologist/property & resource coordinator Sergio Carbone lead the trip. Dufferin Aggregate's Milton Quarry is Canada's largest, extracting and processing approximately 6 million tonnes of aggregates from the Amabel Formation dolostone annually.

On September 14th, the District Geologist co-lead a field trip "Industrial Minerals, Geology and Wineries of the Niagara region" for Resident Geologist Program staff and MNDM Deputy Minister Cameron Clark. The other co-leader was Simon Haynes, a geology professor at Brock University. The trip visited Canada Bricks' Burlington Quarry and Brick Plant, Georgia-Pacific Canada's Caledonia Wallboard Plant, and Walker Industries' Vineland Quarries. The field guide to this trip was published in December as OGS OFR 6029.

The District Geologist co-lead an October 16th field trip sponsored by CIM Toronto Branch, CIM Industrial Minerals Division and MNDM entitled "Mines and Wines: Industrial Minerals and Rocks, Geology and Wineries of the Niagara region". The other co-leader was Simon Haynes. The trip had 33 participants and was joined later in the day by Minister of Northern Development and Mines, the Honourable Tim Hudak. The field trip guidebook was published by CIM.

The District Geologist lead a tour on October 19-20th to selected industrial mineral operations across southwest Ontario for Paul Harris, Assistant Editor, *Industrial Minerals* and *North American Mineral News*. Paul also joined the above noted October 16th field trip. While in Ontario, Paul visited petalite, gypsum, salt, brick, lime and aggregate operations. These commodities were highlighted in a December 2000 *North American Mineral News* article entitled "Ontario: Industrial Mineral Activity Increasing".

Conferences & Meetings

In January, the District Geologist presented an overview of the minerals industry of southwest Ontario to a gathering of mineral explorationists in Tweed.

In March, the District Geologist and District Support Geologist were actively involved in Mining Millennium 2000 convention. Activities included: 1) assisting with the OGS display; 2) assisting with the World Mines Ministers Forum; and 3) attending technical sessions including industrial mineral presentations.

The District Geologist, in co-operation with the Southern Ontario Regional Resident Geologist Office located in Tweed, designed and constructed the southern Ontario mining and exploration display for the Northeast and Northwest Ontario Mines and Minerals Symposia. The display highlighted the many industrial mineral commodities that are currently mined or quarried in southern Ontario from over 75 active operations. The display also included recommendations for exploration across southern Ontario. In April, the District Geologist presented the display at the Northwest Ontario Mines and Minerals Symposium in Thunder Bay.

The Southern Ontario Resident Geologist staff hosted the Resident Geologist Program annual meeting at Acton from September 10-14th. Approximately 30 staff attended 3 days of meeting and 1.5 days of field trips. At the meeting, the District Geologist co-presented "The Minerals Industry of Southern Ontario – an Overview". The District Geologist and District Support Geologist provided logistical support to the meeting.

The District Geologist attended the Eastern Section, American Association of Petroleum Geologists, 29th annual meeting, hosted by the Ontario Petroleum Institute, September 23-27th in London, ON. During the meeting, the District Geologist participated in 3 field trips: "Depositional Environments and Paleoecology of Middle and Upper Devonian Strata in Southwestern Ontario"; "From Rock to Edifice – An Introduction to Building Stones in the City of London"; and "University of Western Ontario Rock Garden as an artificial mapping area for teaching and outreach". Technical sessions at the meeting, included the following presentations:

- "Diagenetic history of Ordovician carbonates from hydrocarbon reservoirs and outcrops in southern Ontario: unanswered questions"
- "Middle Devonian Reservoirs of Ontario: Rediscovering a historic play using modern methods and technology"
- "An overview of the Silurian reef Play – Southwestern Ontario"
- "Lake Erie Gas: Is it a jewel in the rough for Talisman Energy?"
- "Cambrian Oil and gas reservoirs in Ontario"

- "Changes of Salina A and B lithofacies from the Michigan to Appalachian Basins: salt solution or non-deposition in the Salina Group?"
- "Tectonic framework of the Precambrian basement of southwestern Ontario revisited"

In October, the District Geologist attended Industrial Minerals 2000 – The 12th Annual Canadian Conference on Markets for Industrial Minerals held in Toronto. The District Geologist helped design, set-up and staffed a MNDM Industrial Minerals display. Available at the display was an updated directory and introduction to Ontario's Industrial Mineral producers, projects and investment opportunities. Approximately 100 industrial mineral specialists from across North America attended the conference. Technical sessions included presentations on a variety of commodities including: calcium carbonate, nanoclays, pumice, kaolin, vermiculite, soda ash, silica, perlite, fly ash and cement. The 2001 conference will again be held in Toronto in October.

In December, as part of the Ontario Exploration & Geoscience Symposium in Toronto, the District Geologist was a co-presenter with Pam Sangster, Regional Resident Geologist Southern Ontario, of a paper entitled "A Billion $ Business: Mineral Resources of Southern Ontario". Other staff activities at this meeting included: 1) in co-operation with Southeast Ontario District staff, a poster presentation entitled "A Billion $ Business: Mineral Resources of Southern Ontario", highlighting recommendations for exploration; 2) presentation of MNDM Industrial Minerals display; and 3) in co-operation with Mines and Minerals Information staff, presentation of Ontario Mineral Producers and Advanced Exploration Projects poster map.

The District Geologist attended a number of CIM-Toronto Branch and Toronto Geological Discussion Group presentations in 2000. District staff also attended 2 Heritage Toronto building stone presentations on The Whitney Block and the Ontario Legislature Building.

Land Use Planning

The District Geologist and District Support Geologist were involved in a number of land use planning initiatives that required Ministry input throughout the year

Starting in mid 2000, the District Geologist served as a member of the City of Brampton, Northwest Brampton Urban Boundary Review, Shale Resources Review steering committee. The project involves a consultant study to determine the amount and location of shale resources to be protected for future extraction by the brick industry. As a committee member, the District Geologist provided input into the project's Terms of Reference, and attended meetings with the successful consultant where recommendations on methodologies and listing of relevant OGS, GSC and other shale/brick references were provided. The project continues, with the consultant's report expected in spring 2001.

In October, the District Geologist made a presentation to South Bruce Peninsula Municipal Council on the role of MNDM in land use planning and the significance of the Eramosa Dolostone/Marble quarried within the Wiarton area. The municipality is in the process of updating and consolidating its Official Plan and has placed a temporary moratorium on the development of new quarries as well as expansions to existing operations. There are currently more than 10 operating building stone quarries within the municipality. In November, the District Geologist met with the municipality's planning consultant for discussions on the significance of the Eramosa Dolostone/Marble quarried within the Wiarton area and potential resource areas for further development within Eramosa Member dolostone.

The Niagara Escarpment Commission initiated the Niagara Escarpment Plan 5-year review. The District Geologist provided comments on the Terms of Reference for the review.

In 1999, the District Geologist co-authored a report with the Senior Manager, OGS Sedimentary Geoscience Section, for the Niagara Escarpment Commission (NEC) on the geology and physiography of the Escarpment in the vicinity of the Milton Outlier. As a result of this report, the District Geologist was asked by the NEC to participate

as an expert witness in a joint Ontario Municipal Board-Niagara Escarpment Plan hearing concerning the future use of lands in the Milton area. In March, the District Geologist attended approximately 5 days of the hearing and provided expert testimony on the geological definition and location of the Niagara Escarpment in the Milton area.

In support to land use planning related to Official Plans and Official Plan Amendments, the District Geologist/District Support Geologist provided information packages, including outlined areas of MNDM planning interest, to the Ministry of Municipal Affairs and Housing (MMAH) for the following planning authorities:

- Oxford County
- Middlesex County
- Brant County
- Elgin County
- Lambton County
- Regional Municipality of Niagara

The District Geologist also reviewed and provided comments to MMAH on the following:

- Brant County Official Plan
- Bayham Township Official Plan
- Malahide Township Official Plan

Other land use planning related activities included: 1) holding a meeting with MMAH planners on the shale resources and associated issues in the regions of Peel and Halton; 2) constructing a common legend for 9 OGS maps for Oxford County; 3) providing map and definition information on hummocky terrain for Upper Thames River Conservation Authority; and 4) meeting MMAH planners to discuss screening criteria when using MNDM databases.

Public Education

The Southwest Ontario District is home to approximately 75% of Ontario residents. To service the general interest inquiries from the approximately 8 million District residents, staff of the Southwest Ontario District participates in a limited number of public education projects.

The importance of industrial mineral operations to the people and economy of southern Ontario was emphasized in a minerals partnership display that was organized and designed by the District Geologist entitled " Your Use of Ontario's Mineral Resources" at the International Plowing Match at Fergus, September 19th-23rd. Display partners were PDAC Mining Matters, Royal Ontario Museum Paleobiology Department, Bancroft & District Chamber of Commerce, University of Waterloo Earth Sciences Museum, Dufferin Aggregates, Blue Circle Aggregates, and MNDM. Approximately 15 000 people stopped by the display to review materials and samples over the course of the 5-day event. During this period approximately 4000 mineral, rock and fossil samples were distributed to school groups, teachers, children and the general public.

The District Geologist is an active member of the PDAC Education Committee. This group's major project is the PDAC Mining Matters, which involves the building of teaching kits designed for the grade 4 and 7 levels that illustrate the importance of minerals, rocks, metals and mining in today's society. In March, Southwest Ontario District staff helped at the PDAC Mining Matters display at the Mining Millenium 2000 Convention. Other activities conducted by the District Geologist related to the PDAC Mining Matters include: interviewing and hiring a new teacher/project coordinator for the program in May; organizing a quarry tour for this individual in July; and helping to present a display at Science Teachers of Ontario annual conference in November.

SOUTHWEST ONTARIO--2000

In 2000, PDAC Mining Matters volunteers and students assembled an additional 600 grade 4 classroom teaching kits, each of which contains more than 60 mineral and rock samples. Southwest Ontario District staff arranged for the donation and collection of kit materials including quartzite, shale, limestone, sandstone and gypsum samples from Unimin Canada Inc., Canada Brick, Beachville Lime Ltd., Rice and McHarg Quarries, and Georgia-Pacific Canada, respectively.

In February, the District Geologist helped organize and attended the 1999 Junior Miner of Ontario luncheon and presentation. As part of the event, MNDM Deputy Minister Cameron Clark presented Elaine Quinn of Trenton with a sample of Ontario Amethyst and a medal. The Junior Miner award is part of the PDAC Mining Matters program.

In March, the District Geologist and District Support Geologist were actively involved in public education events at Mining Millennium 2000 convention in Toronto. As part of the Welcoming Sunday children and family program, staff created and assisted in presenting the following activities and displays:
Activities

- "Using Rocking Colours"
- "Find the Iron Mine"
- "Find the Pencil"
- "Gold Panning"

Displays

- "Minerals in the Home"
- "Minerals in Your Life"
- "Getting Minerals from the Ground to You"
- "Mining in Your Backyard"

The District Geologist is one of the leaders of a partnership project entitled Geoscape Toronto that is designed to highlight the interaction of geology, landscape, earth and water resources, and people within the Greater Toronto Area. Geoscape Toronto will produce a poster for students, teachers, land-use planners, and the public. The project includes representatives from the OGS, Geological Survey of Canada, University of Toronto, Royal Ontario Museum, Ministry of Municipal Affairs and Housing, Niagara Escarpment Commission and the private sector. The District Geologist is leading a team creating the Niagara Escarpment panel, one of 5 theme panels on the poster highlighting the most significant physiographic features in the GTA. The District Geologist was co-author of Geoscape Toronto presentation at Geology Information and Education conference in Australia.

The District Geologist made a limited number of in school presentations. Five grade 4 classes were provided the opportunity to learn first hand about mineral and rock samples as part of "Minerals in Your Life" presentations.

RECOMMENDATIONS FOR EXPLORATION

Markets/Marketing

The extraction of industrial minerals is closely tied to the demand, economics and markets of the associated commodities and products. Short distances of transportation by truck, train or vessel make industrial mineral products derived in southern Ontario readily accessible to large markets around the Great Lakes region.

Access to Great Lakes Markets

The economic success of many industrial mineral operations depends on nearby access to Great Lakes ports. In Ontario, industrial mineral operations for cement, aggregate, salt, silica, trap rock, and soda ash rely on ports to move product for processing and, especially, to customers.

The current and projected future demand for **cement** and **aggregate** makes exploration and development of new operations attractive. Ready access to port facilities is a significant economic consideration for new large-scale aggregate and cement operations. It could also be an important factor in siting new **lime** and **building stone** quarries.

For the shorelines of Lakes Huron, Erie and Ontario, and the St. Lawrence River, it is recommended that current and potential deep-water ports be inventoried, followed by an assessment of the geology and mineral deposits within the immediate vicinity of each port. Land-use-planning considerations at each port should also be evaluated.

The geology of southern Ontario is favourable for the development of new industrial mineral operations near ports.

Multiple Commodities

Across southwest Ontario, quarries for aggregate, cement, dimension stone, landscape stone and chemical stone all remove quantities of cover or unsuitable rock to gain access to their primary resource. In some cases, the quarry owners process and market this secondary resource, either with in-house resources or via contractors. Two current examples in southwest Ontario are a landscape stone quarry crushing waste rock and selling it as aggregate or fill, and a chemical limestone quarry removing the top weathered rock in blocks for amour stone use. In other cases, the secondary resources are used for backfill or stockpiled.

The opportunity may exist for additional contractors to access, process and market these secondary resources. Contractors with expertise in particular commodities and/or markets may be able to value-add to secondary resources.

It is recommended that all non-primary resource materials extracted during quarrying operations be evaluated for other possible uses, especially those that may have high, value-added potential. Higher value-added opportunities exist for some of these resources, particularly for **landscape stone**, **dimension stone**, and **engineering stone** uses.

Landscape and Dimension Stone

The housing construction boom in southern Ontario and the surrounding Great Lakes region has expanded markets for landscape and dimension stone.

Guelph Formation Dolostone

There is strong demand for **Eramosa Dolostone/Marble** for dimension stone, residential decorating and landscaping markets. The Eramosa Member of the Guelph Formation is a thin-bedded dolostone that has been quarried on the Bruce Peninsula since the early 1900s for a variety of building and landscaping stone products. Dolostone from the Eramosa Member is currently extracted at 12 operating quarries near Wiarton, Ontario. Many of these quarries have operated for decades and now have limited reserves. In order to maintain supply or expand future markets, new exploration and testing of suitable Eramosa Member deposits is recommended.

In the late 1980s the OGS completed a mapping project on the stratigraphy and resource potential of the Eramosa Member on the Bruce Peninsula (OGS-Open File Report 5662, 1988). The report presents a description of the lithology of the Eramosa Member, a discussion of the stratigraphic relationships both within the Member and with respect to its bounding formations, comments on its regional distribution, and aspects of its resource potential as a building stone. As a follow-up project, the OGS did detailed mapping of the Paleozoic Geology of the Bruce Peninsula (OGS-Open File Map 198, 1992; OGS-Open File Report 5856, 1993; OGS-Open File Report 5875, 1993). These references should be considered as primary reference materials in exploration for Eramosa Member dolostone.

Gull River Formation Limestone

Currently within the Southwest Ontario District, limestone of the Upper Member of Gull River Formation is extracted at 2 quarries in Rama Township. The light grey, medium bedded, lithographic limestone, with small

patches of calcite crystals or "birdseye" texture, weathers light grey to white. The exposed, weathered surface of this limestone unit is currently in demand for landscape projects, thus creating a need for additional, long-term supply of the stone. New exploration and testing for suitable units of Gull River Formation limestone is recommended.

In the late 1990s the OGS completed a mapping project on the Paleozoic geology and stratigraphy of the northern Lake Simcoe area (OGS-Open File Report 6011, 2000). As part of the project, the OGS did detailed mapping of the Paleozoic Geology of the area from Midland to Bobcaygeon (OGS-Open File Maps 222 and 235, 1993 and 1994; OGS Map P.3339, 1995). These references should be considered as primary reference materials in exploration for Gull River Formation limestone.

Industrial Minerals

Large resources of **salt, gypsum,** brick quality **shale,** and high-purity and cement grade **limestone** have been identified in southwest Ontario. All of these commodities are currently in production. New deposits await development as market and economic conditions warrant. Some resources are at or near surface while others require significant infrastructure to access the deposits at depth.

Guelph Formation Dolostone

The Guelph Formation is well known as a resource for the production of high-purity dolomite and calcined products for use in the iron and steel industry. Additional potential uses of high-purity dolomite include the production of magnesium metal, chemicals, plastics, rubber and refractories. The bank reef complex and inter-reef depositional environments within the Guelph Formation form good targets for very high-purity dolomite deposits. Analyses of Guelph Formation drill core indicate intervals of extremely pure, nearly 100% dolomite (21.8% MgO). Areas of potential include the northern Bruce Peninsula, Beachville-Ingersoll, and Owen Sound to Woodstock. Dolomite prospects are listed in Table 6 (Kelly, 1996; Feenstra and Smith, 1997; Feenstra and Wilson, 1996; Feenstra, Wilson and Tanglis, 1995).

Sylvania Formation Silica Sand

Prospects of highly quartzose and friable sandstone of the Sylvania Formation occur at the base of the Detroit River Group below the Amherstburg Formation. Unprocessed, raw Sylvania sandstone grades at about 94% SiO_2, whereas the silica content of washed material may reach 98-99.5% SiO_2. Silica sand prospects are listed in Table 6 (Feenstra and Smith, 1997).

OGS ACTIVITIES AND RESEARCH BY OTHERS

Table 4 lists new OGS and Geological Survey of Canada (GSC) publications on southwest Ontario released or received in 2000.

The OGS, Sedimentary Geoscience Section conducted 4 projects within the Southwest Ontario District in 2000.

In the spring, Derek Armstrong commenced a mapping and geochemical sampling project of the Queenston Formation. Queenston Shale is the primary resource for Ontario's brick industry. The study included detailed examination and sampling of presently active quarries, significant outcrops and available drill cores from a total of 40 sites, followed by a 10 hole diamond drill program with drill holes ranging to vertical depths between 24 to 75 m.

Preliminary results for the project are reported in the OGS 2000 Summary of Field Work and Other Activities, OFR 6032.

In a cooperative project, Derek Armstrong logged drill core from 6 diamond drill holes drilled by Ontario Power Generation Inc. into bedrock in the Rouge River valley. The drill logs were published in 2000.

OGS Sedimentary Geoscience Section staff worked on the production of 2 Aggregate Resources Inventory Papers (ARIP); George Gao undertook fieldwork in Huron County and additional data was compiled for the Regional Municipality of Durham. The ARIPs for these 2 areas will be released in 2001.

Since 1993, Geological Survey of Canada staff has been leading a geology and hydrogeology study of the Oak Ridges Moraine. The GSC released two additional publications from this project in 2000.

Tukasz Skublicki, a Ph.D. candidate at the U of Saskatchewan, is researching the sedimentology and paleoenvironment of the Amabel Formation between Clappison Corners and the Acton Quarry in southern Ontario.

REFERENCES

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Armstrong, D.K. and Rheaume, P. 1994. Paleozoic geology, Fenelon Falls area, southern Ontario; Ontario Geological Survey, Open File Map 235, scale 1;50 000.

Feenstra, B.H. and Smith, Patrica 1997. Southwestern Resident Geologist's District; *in* Report of Activities 1996, Resident Geologists, Ontario Geological Survey, Open File Report 5958, p. 13-1 – 13-9.

Feenstra, B. H. and Wilson, A. C. 1996. Southwestern Resident Geologist's District; *in* Report of Activities 1995, Resident Geologists, Ontario Geological Survey, Open File Report 5943, p. 377-385.

Feenstra, B. H., Wilson, A. C. and Tanglis, C. 1995. Southwestern Resident Geologist's District; *in* Report of Activities 1994, Resident Geologists, Ontario Geological Survey, Open File Report 5921, p. 303-311.

Kelly, R.I., 1996: High-Purity Calcite and Dolomite Resources in Ontario, Ontario Geological Survey, Open File Report 5954, 39p.

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Figure 1. Producing Mines and Quarries – Southwest Ontario District, 2000

- **Producing Mines**
  1. Sifto Canada Inc., Goderich Mine, Goderich — rock salt
  2. The Canadian Salt Company Ltd., Ojibway Mine, Windsor — rock salt
  3. Georgia Pacific Canada Inc., Caledonia No. 3 Mine, Caledonia — gypsum
  4. CGC Inc., Hagersville Mine, Hagersville — gypsum

- **Producing Quarries – Cement**
  5. Lafarge Canada Inc., Woodstock Quarry, Zorra Tp. — limestone
  6. Blue Circle Cement, St. Marys Quarry, Blanshard Tp. — limestone
  7. Blue Circle Cement, Bowmanville Quarry, Darlington Tp. — limestone
  8. St. Lawrence Cement Inc. Mississauga Quarry, Mississauga — shale

- **Producing Quarries – Brick Products**
  9. Brampton Brick Ltd., Cheltenham Quarry, Caledon Tp. — shale
  10. Canada Brick, Streetsville Quarry, Mississauga — shale
  11. Canada Brick, Milton Quarry, Esquesing Tp. — shale
  12. Canada Brick, Burlington Quarry, Burlington — shale
  13. Canada Brick, Aldershot Quarry, Burlington — shale
  14. George Coultis and Son Ltd., Thedford Quarry, Bosanquet Tp. — shale
  15. Century Brick, Georgetown Quarry, Esquesing Tp. — shale

- **Producing Quarries – Chemical, Metallurgical, & Filler Stone Products**
  16. Beachville Lime Ltd., West (south) Quarry, Zorra Tp. (closed June 2000) — limestone
  17. Beachville Lime Ltd., Centre Quarry, Zorra Tp. — limestone
  18. Guelph Lime Ltd., Guelph Quarry, Guelph — dolomite
  19. E. C. King Contracting Ltd., Sydenham Quarry, Sydenham Tp. — dolomite
  20. Lafarge Canada Inc., Dundas Quarry, West Flamborough Tp. — dolomite

- **Producing Quarries – Dimension, Building , Landscape Stone**
  21. Arriscraft International Inc., Adair Marble Quarries, Albemarle Tp. — dolostone
  22. Owen Sound Ledgerock Ltd., Senesun Quarry, Amabel Tp. — dolostone
  23. Owen Sound Ledgerock Ltd., Wiarton Quarry, Amabel Tp. — dolostone
  24. Owen Sound Ledgerock Ltd., Owen Sound Quarry, Keppel Tp. — dolostone
  25. Ebel Quarries Inc., Ebel Quarry, Amabel Tp. — dolostone
  26. Emerson McLay Quarry, Albemarle Tp. (temporary stopped production June 2000) — dolostone
  27. Amsen Quarries Ltd., Mar Quarry, Albemarle Tp. — dolostone
  28. Amsen Quarries Ltd., Wiarton Quarry, Amabel Tp. — dolostone
  29. 1399654 Ontario Ltd., Ross Quarry, Amabel Tp. — dolostone
  30. Speiran Quarries Ltd., Speiran Quarry, Ramara Tp. — limestone
  31. Deforest Brothers Quarry Ltd., Deforest Brothers Quarry, Caledon Tp. — sandstone
  32. Hilltop Stone and Supply Inc., Hilltop Quarry, Esquesing Tp. — sandstone
  33. Rice and McHarg Ltd., Rice and McHarg Quarry, Esquesing Tp. — sandstone
  34. Georgian Bay Marble and Stone, Wiarton Quarry, Amabel Tp. — dolostone
  35. Georgian Bay Marble and Stone, Cook Quarry, Amabel Tp. — dolostone
  36. Flamboro Quarries Ltd., Flamboro Quarry, West Flamboro Tp. — dolostone
  37. A & A Natural Stone Ltd., A & A Quarry, Keppel Tp. — dolostone
  38. Cut Above Natural Stone, Cut Above Natural Stone Quarry, Ramara Tp. — limestone
  39. Rama Stone Quarries Ltd., Fleming Quarry, Ramara Tp. — gneiss
  40. Wiarton Stone Quarry Inc., Wiarton Stone Quarry, Amabel Tp. — dolostone
  41. Stone Cottage Inn Ltd , Attia Quarry, Ramara Tp. — dolostone

- **Producing Brine Well Fields – Salt**
  42. General Chemical Canada Ltd., Anderdon Brine Field, Anderdon Tp. — salt in brine
  43. Sifto Canada Inc., Goderich Brine Field, Goderich — salt in brine
  44. The Canadian Salt Company Ltd., Windsor Brine Field, Windsor — salt in brine

LAKE
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SOUTHERN REGIONAL RESIDENT GEOLOGIST
SOUTHWEST ONTARIO DISTRICT
SCALE: 1:2,000,000
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Table 1. Selected Industrial Mineral Production in Ontario

NON-METALS	1996 Quantity (000 tonnes)	1996 Value (000 $)	1997 Quantity (000 tonnes)	1997 Value (000 $)	1998 Quantity (000 tonnes)	1998 Value (000 $)	1999 Quantity (000 tonnes)	1999 Value (000 $)
Gypsum (1)	1 007	12 247	1 046 (*1 075)	14 171	1 047 (*1 080)	14 780	978 (*1143)	15 430
Salt (1)	8 402	256 156	8 968 (*9 740)	275 229	8 344 (*9 650)	248 020	7 787	246 231
Total all non-metals		**363 080**		**399 329**		**375 446**		**386 234**
STRUCTURAL MATERIALS	**Quantity (000 tonnes)**	**Value (000 $)**	**Quantity (000 tonnes)**	**Value (000 $)**	**Quantity (000 tonnes)**	**Value (000 $)**	**Quantity (000 tonnes)**	**Value (000 $)**
Clay products (2)		76 200		102 713		102 616		128 682
Cement (4)	5 212	384 570	5 248	446 497	5 191	460 179	5 530	510 532
Lime (2)	1 317	103 535	1 344	108 884	1 334	108 766	1 384	121 913
Sand and Gravel (3)	86 571	321 079	90 515	337 137	88 186	325 109	86 705	321 663
Stone (3,	39 620	267 710	44 839	299 792	50 689	344 707	49 602	360 238
Total all structural materials		**1 153 094**		**1 295 023**		**1 341 377**		**1 443 027**
FUELS	**Quantity (000 m^3)**	**Value (000 $)**	**Quantity (000 m^3)**	**Value (000 $)**	**Quantity (000 m^3)**	**Value (000 $)**	**Quantity (000 m^3)**	**Value (000 $)**
Natural gas (1)	307 000	31 188	270 000	37 686	276 000	39 917	304 000	43 989
Petroleum (1)	268	49 562	227	41 136	219	26 722	247	42 113
Total fuels		**80 750**		**78 822**		**66 639**		**86 102**
Total all Industrial Minerals		**1 516 174**		**1 694 352**		**1 716 823**		**1 829 261**
Total all Minerals		**5 710 028**		**5 614 963**		**5 065 395**		**5 120 515**
Industrial minerals % of total mineral s		**26.6**		**30.2**		**34.0**		**36.0**

(1) all production from Southwest Ontario District
(2) >90% production from Southwest Ontario District
(3) >75% production from Southwest Ontario District
(4) >50% production from Southwest Ontario District
**Production as reported by companies to the District Geologist.*

after Ontario Mineral and Exploration Statistics 1999; MNDM, 2000

Table 2. Mine Production and Reserves in the Southwest Ontario District (as reported by companies to the District Geologist)

Mine	Production in 2000 Tonnage @ Grade	Production in 1999 Tonnage @ Grade	Production in 1998 Tonnage @ Grade	Reserves at end of 2000 Tonnage	Grade
Caledonia No. 3 Mine	287 000 t @ 75-80% gypsum/t	418 000 t @ 75-80% gypsum/t	400 000 t @ 70-75% gypsum/t	39 500 000 t	70-75% gypsum/t
Hagersville Mine	700 000 t @ 85% gypsum/t	725 000 t @ 85% gypsum/t	680 000 t @ 85% gypsum/t	12 300 000 t	85% gypsum/t
Goderich Mine	4 200 000 t @ 97% NaCl/t	4 750 000 t @ 97% NaCl/t	6 000 000 t @ 97% NaCl/t	350 000 000 t	97% NaCl/t
Ojibway Mine	2 350 000 t @ 97% NaCl/t	2 436 000 t @ 97% NaCl/t	2 500 000 t @ 97% NaCl/t	89 200 000 t	97% NaCl/t

t = tonne

Table 3. Property visits conducted by the Southwest Ontario District Geologist in 2000

Property/Occurrence/Plant/Geological Site	Location	Commodity
Walker Industries Vineland Quarries (4)	Vineland	dolostone/aggregate
Canada Brick Burlington Quarry & Brick Plant (4)	Burlington	shale/brick
CGC Inc. Hagersville Mine and Wallboard Plant	Hagersville	gypsum/wallboard
Carmeuse NA Beachville Operations (2)	Zorra Tp.	limestone/lime
Sifto Canada Goderich Mine	Goderich	rock salt
University of Waterloo rock garden	Waterloo	rock specimens
Dufferin Aggregates Milton Quarry (3)	Esquesing Tp.	dolostone/aggregate
Georgia-Pacific Caledonia Wallboard Plant	Caledonia	gypsum/wallboard
Brampton Brick Plant	Brampton	shale/brick
G. Coultis & Son Thedford Quarry	Bosanquet Tp.	shale/fossils
Brampton Brick Hungry Hollow quarries	Williams Tp.	shale/fossils
Vermiculite prospects	Galway & Cavendish Tps.	vermiculite
Brampton Brick Cheltenham Quarry	Caledon Tp.	shale
Century Brick Georgetown Quarry	Esquesing Tp.	shale
OMYA Tatlock Quarry	Darling Tp.	calcium carbonate
Rice & McHarg Quarry	Esquesing Tp.	sandstone/building stone
Attia Quarry	Ramara Tp.	limestone/building stone
Stone Cottage Inn Ltd. proposed Sebright Quarry	Ramara Tp.	limestone/building stone
Speiran Quarry	Ramara Tp.	limestone/building stone
Cut Above Natural Stone Quarry	Ramara Tp.	limestone/building stone
Rama Stone Quarry	Ramara Tp.	gneiss/aggregate
Woods/Longford Quarry	Ramara Tp.	limestone-aggregate
Owen Sound Ledgerock Ltd. office/plant	Keppel Tp.	dolostone/building stone
A&A Natural Stone Quarry	Keppel Tp.	dolostone/building stone
Wiarton Stone Quarry	Amabel Tp.	dolostone/building stone
Ebel Quarry	Amabel Tp.	dolostone/building stone
E. C. King Contracting Sydenham Quarry	Sydenham Tp.	dolostone/aggregate/dolime
Delphi Point	Craigleith	limestone/fossils
Georgian Aggregates Dunrobin Quarry	Nottawasaga Tp.	dolostone/aggregate
Canada Brick Milton Quarry	Trafalgar Tp.	shale
Proposed Rockfort Quarry	Caledon Tp.	dolostone/aggregate

Table 4. New Ontario Geological Survey (OGS) and Geological Survey of Canada (GSC) Publications on Southwest Ontario Released or Received in 2000.

Title	Author	Type and Year of Publication
Precambrian Geology, Orillia Area	Lumbers, S.B. and Vertolli, V.M.	Ontario Geological Survey, Preliminary Map P.3407, scale 1:50 000, 2000
Precambrian Geology, Elmvale Area	Lumbers, S.B. and Vertolli, V.M.	Ontario Geological Survey, Preliminary Map P.3408, scale 1:50 000, 2000
Mining in Ontario the future is here: Exploration Opportunities 2000	Ontario Geological Survey Staff	Ontario Geological Survey, Compendium of exploration targets, 2000
Paleozoic Geology of the Northern Lake Simcoe Area, South-Central Ontario	Armstrong, D.K.	Ontario Geological Survey, Open File Report 6011, 52p., 2000
Report of Activities 1999, Resident Geologist Program, Southern Ontario Regional Resident Geologist Report: Southeastern and Southwestern Districts, Mines and Minerals Information Centre, and Petroleum Resources Centre	Sangster, P.J., McGuinty, W.J., Papertzian, V.C., Steele, K.G., Lee, C.R., Laidlaw, D.A. and Carter, T.R.	Ontario Geological Survey, Open File Report 6008, 79p., 2000
Precambrian Geology, Gravenhurst Area	Lumbers, S.B., Vertolli, V.M. and Schwerdtner, W.M.	Ontario Geological Survey, Preliminary Map P.3409, scale 1:50 000, 2000
Precambrian Geology, Penetanguishene Area	Lumbers, S.B., Vertolli, V.M. and Schwerdtner, W.M.	Ontario Geological Survey, Preliminary Map P.3410, scale 1:50 000, 2000
Mines and Wines: Industrial Minerals, Geology and Wineries of the Niagara Region-Field Trip Guidebook	Steele, K.G. and Haynes, S.J.	Ontario Geological Survey, Open File Report 6029, 25p., 2000
Shale Resources of the Queenston Formation	Armstrong, D.K.	In Summary of Field Work and Other Activities 2000, Ontario Geological Survey, Open File Report 6032, 2000, p. 39-1 to 39-6
Lithostratigraphic Logging of Six Bedrock Boreholes in the Rouge River Valley, Southern Ontario	Armstrong, D.K.	Ontario Geological Survey, Open File Report 6038, 39p., 2000
Wellbore temperature measurements and preliminary interpretation in terms of groundwater movement in the Oak Ridges Moraine, Ontario	Taylor, A., Allen, V., Burgees, M. and Naufal, J.	Geological Survey of Canada, Open File 3787, 1999
Middle Devonian (Givetian, Hamilton Group) ostracoda in two diamond drill cores from Lambton County, southwestern Ontario	Copeland, M.J.	Geological Survey of Canada, Bulletin 537, 72p., 1999
Current Research 1999-E	L.S. Lane et al.	Geological Survey of Canada, Current Research 1999-E, 213p., 1999

Current Research 2000	Natural Resources Canada – Geological Survey of Canada	Geological Survey of Canada, Articles A1 - A22; B1 - B5; C1 - C24; D1 – D13 and E1 - E15 on 1 CD-ROM, 2000
Principal mineral areas of Canada	Minerals and Metals Sector and National Energy Board	Geological Survey of Canada, Map 900A, Forty-ninth edition, scale 1:6 000 000, 1999
Peatlands of Canada	Tarnocai, C., Kettles, I.M. and Lacelle, B.	Geological Survey of Canada, Open File 3834, scale 1:6 500 000, 2000
Release of high resolution aeromagnetic total field survey of Lake Ontario-New York area	Kiss, F. and Coyle, M.	Geological Survey of Canada, Open File 3746 a-j, 10 sheets, scale 1:100 000, 2000
Form and sedimentary fill of tunnel channels beneath the Oak Ridges Moraine, southern Ontario: the Holland Marsh – King City Channel System	Russell, H.A.J., Sharpe, D.R., Pullan, S.E. and Barnett, P.J.	Geological Survey of Canada, Open File 3841, 1 sheet, 2000

Table 5. Selected Publications Received in 2000 by Southwest Ontario District Geology Office (Mines and Minerals Information Centre) of particular reference to Southwest Ontario.

Title	Author	Type and Year of Publication
1998 Canadian Minerals Yearbook Review and Outlook	Godin, E. (ed.)	Minerals and Metals Sector, Natural Resources Canada, Ottawa, 1999
Proceedings of the 33rd Forum on the Geology of Industrial Minerals	Belanger, M., Clark, T. and Jacob, H-L. (eds.)	CIM Special Volume 50, Canadian Institute of Mining, Metallurgy and Petroleum, Montreal, 288p., 1998
Industrial Minerals Directory: A world guide to producers and processors	Keegan, N. (ed.)	Fourth edition, Industrial Minerals Information Ltd, Surrey UK, 622p., 1999
Raw Materials for Pigments, Fillers & Extenders	Keegan, N. (ed.)	3rd edition, Industrial Minerals Information Limited, Surrey UK, 114p., 2000
Ontario Mining & Exploration Directory 2000	Norman, D. (ed.)	Directory, Naylor Publications Company (Canada), Winnipeg Manitoba, 42p., 2000
Southern Ontario Resident Geologist Program Source Book		Ministry of Northern Development and Mines, 15p., 2000
Ontario Mineral and Exploration Statistics Statistiques minières et d'exploration de l'Ontario 1999		Ministry of Northern Development and Mines, Queen's Printer for Ontario, 86p., 2000

Aggregate Industry Safe Work Practices	Aggregate Producer's Association of Ontario and Mines and Aggregates Safety and Health Association	Booklet, MASHA/APAO, 74p., 2000
Mining and Mineral Processing Operations in Canada 1999	Ralph, L. and Maglaras, M.	Minerals and Metals Sector, Natural Resources Canada, Ottawa, 83p., 2000
Ordovician and Silurian Rocks and Fossils of the Southern Georgian Bay Area, Ontario	Rudkin, D., Stott, C., Tetreault, D. and Rancourt, C.	Field Trip Guidebook No. 7, Geological Association of Canada, St. John's, Newfoundland, 47p., 1998
Fused Minerals: Supply, grades & markets	O'Driscoll, M. (ed.)	Industrial Minerals special review, Metal Bulletin plc, Surrey UK, 54p., 2000
Aggregate Resources of Ontario: Provincial Standards		Version 1.0, Ministry of Natural Resources, Peterborough ON, 1997
Mines and Wines: Industrial Minerals and Rocks, Geology and Wineries of the Niagara Region	Haynes, S.J. and Steele, K.G.	Field Trip Guide Book, Canadian Institute of Mining, Metallurgy and Petroleum (CIM) - Industrial Minerals Division and Toronto Branch, 25p., 2000
Carbonate Cores of the Middle Ordovician Trenton and Black River Groups of Southwestern Ontario	Colquhoun, I.M. and Trevail, R.A.	Core Workshop Oil Gas and Salt Resources Library,Ontario Petroleum Institute Inc., London, Ontario, 54p with inserts, 2000
Depositional Environments and Paleoecology of Middle and Upper Devonian Strata in Southwestern Ontario	Tsujita, C.J. and Tetreault, D.K.	Guidebook AAPG Field Trip #3, Ontario Petroleum Institute Inc., London, Ontario, 45p., 2000
Oil Heritage Tour of Lambton County: The Birthplace of the Canadian Oil Industry	Cochrane, R.O. and Fairbank, C.O.	Field Trip Lambton County, Ontario Petroleum Institute Inc., London, Ontario, 74p. with appendicies and pullout map, 2000

Table 6. Mineral Deposits Not Being Mined in the Southwest Ontario District in 2000

Abbreviations

AF ..... Assessment Files
CMH ..... Canadian Mines Handbook
GR ..... Geological Report
MDC ..... Mineral Deposit Circular
MDIR ..... Mineral Deposit Inventory record
MLS ..... Mining Lands, Sudbury
MR ..... Mining Recorder
NM ..... The Northern Miner
OFR ..... Open File Report
PC ..... Personal Communication

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Amherstburg Quarry Silica Prospect (40J/03SE)	Silica	20 m thick over 66 ha (20-26 by 10^6 t @ 94% SiO_2)	Amherst Quarries (1969) Ltd.	OFR 5861, p. 32 IMR 9, p. 29, 31	Inactive
Big Creek 1 (40J/03SE)	Silica	19.5 m thick @ 25 m (10 by 10^6 t of sandstone)	N/A	IMR 9, p. 29	Inactive
Big Creek 1 (40J/03SE)	Silica	14.6 m thick @ 34.4 m (10 by 10^6 t of sandstone)	N/A	IMR 9, p. 29	Inactive
Dow-Moore 2-20-12 (40J/16NW)	Salt	21 m thick @ 698 m 73 m thick @ 582 m 114 m thick @ 410 m	N/A	PRW Dow-Moore 2-20-XII	Inactive
Eastnor-Lindsay Prospect (41H/03SW)	Dolomite	$60x10^6$ t dolomite @ <0.10% impurities (SiO_2+Fe_2O_3+Al_2O_3)	N/A	PRW OGS Lindsay 7-III W	Inactive
Imperial Oil No. 560, Sombra 2-12-H, Gormlay No. 1 (40J/090NW)	Salt	32.2 m thick @ 612.6 m 84.1 m thick @ 490.7 m 46.9 m thick @ 388.6 m	N/A	PRW Sombra 2-12-H	Inactive
Imperial Oil No. 597, Logierait No. 1-Y-R, R.C. Fleck No. 2B (40J/16NW)	Salt	29.6 m thick @ 680 m 87.8 m thick @ 544 m	N/A	PRW Imperial Oil No. 597B	Inactive
Lindsay Prospect (41H/03SW)	Dolomite	>35 by 10^6 t dolomite @ <0.10% impurities (SiO_2+Fe_2O_3+Al_2O_3)	N/A	PRW OGS Lindsay 31-VIII W	Inactive
Patton Farm (40J/03SE)	Silica	5.4 m thick @ 10.1 m	N/A	IMR 9, p. 29	Inactive

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Sunburst GB #7 McGillivray 41-NB (40P/04NE)	Salt	88.7 m thick @ 363.6 m 5.8 m thick @ 339.5 m	N/A	PRW Sunburst GB #7	Inactive
Tobermory Prospect (41H/04NE)	Dolomite	60 by 10^6 t dolomite @ <0.10 impurities (SiO_2+Fe_2O_3+Al_2O_3)	N/A	PRW OGS St. Edmunds 47-III W	Inactive
Union Gas-Enniskillen No. 29, D.V.L.A. No. 1 (40J/16SW)	Salt	25.6 m thick @ 610.8 m 78.6 m thick @ 485.5 m	N/A	PRW Union Gas-Enniskillen No. 29	Inactive
Union Gas-Moore No. 12 P&I Williams No. 1 (40J/16SW)	Salt	26.2 m thick @ 577.3 m 70.7 m thick @ 456.6 m	N/A	PRW Union Gas-Moore No. 12- P&I Williams No. 1	Inactive
Union –Moore No. 22 (40J/16SW)	Salt	36 m thick @ 580 m 32 m thick @ 437 m	N/A	PRW Union Moore No. 22	Inactive

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Ontario

Ontario Geological Survey
Regional Resident Geologist Program

Mines and Minerals Information Centre – 2000

by

W. J. McGuinty and C. R. Lee

2001

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TORONTO - MINES AND MINERALS INFORMATION CENTRE – 2000

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MINES AND MINERALS INFORMATION CENTRE TORONTO – 2000

W. J. McGuinty[1] and C. R. Lee[2]

[1] Industry Liaison Geologist, Ontario Geological Survey

[2] Regional Support Geologist, Ontario Geological Survey

INTRODUCTION

The Mines and Minerals Information Centre (MMIC) is an information and sales outlet for the Mines and Minerals Division (MMD), Ministry of Northern Development and Mines (MNDM). The Centre serves the mineral exploration, mining and earth science communities and the general public. MMIC offers a wide variety of information and research materials as well as advisory services and expertise on Ontario's geology, rocks and minerals, mineral industries and related regulatory and policy issues. MMIC staff members also provide specific assistance and referral for clients who require information concerning the Ontario Mining Act.

MMIC SERVICES

ERLIS/Geoscience Databases

The Earth Resources and Land Information System (ERLIS) is an electronic archival database of Ontario's geoscience information. ERLIS provides MMIC clients who are researching mineral exploration and geoscience information with access to data sets that contain the following information:

- Mineral exploration assessment work reports filed by mineral industry workers, as part of their obligations under the Mining Act, to maintain their exploration properties in good standing. Over 70 years of this type of reporting is recorded. Assessment reports may include such information as geological maps, geophysical survey results, drill hole logs and locations, and geochemical and assay data.
- Mineral deposit inventory (MDI) records for more than 18,000 mineral occurrences province-wide and their localities along with lithological, lithogeochemical and tectonic assemblage data.
- Information for Ontario as compiled and collected by the Ontario Geological Survey and other agencies.

ERLIS offers clients data search, compilation and integration capabilities through 3 workstations located at MMIC. The system is available for data searches and compilations at no charge. Printed materials in colour or black and white, or digital downloaded products such as maps and text are available at a nominal fee. In addition to ERLIS, most Resident Geologist Program offices around the province have archives of donated geoscience materials that can be obtained for client use via inter-library loan with the assistance of MMIC personnel.

Publication Sales

MMIC serves as a walk-in sales outlet in Toronto for publications produced by the Mines and Minerals Division (MMD), particularly the Ontario Geological Survey (OGS). MMIC maintains a retail stock of over 10,000 different publications, including:

- Geological, geophysical, geochemical and aggregate resource maps and reports,
- Minerals industry statistics and annual activity reports,
- Mineral policy papers,
- Industrial mineral and mineral deposit circulars,
- Geology guidebooks and posters and
- Open file reports

New MMD hardcopy publications are available at MMIC following their publication release dates. Limited quantities of certain publications such as Open File Reports are available for sale at the Centre while supplies last, after which time such products may be purchased from the Ministry's Publication Sales Centre located in Sudbury. Requests for publications made via telephone, mail or e-mail as well as all requests for digital data sets or older Open File Reports are referred to the Publication Sales Centre for purchase and distribution.

Library Services

The MMIC library provides a selection of reference and topical information on earth science and the minerals industry. Directories, science and industry periodicals and journals are available to clients. Table 2 lists current subscriptions to geoscience and mining related newsletters. Table 3 lists the journals and periodical publications added to the MMIC library during 2000.

A limited number of texts and other reference materials are acquired annually for the library by MMIC staff based on client request, industry trends and advances in geoscience. Table 4 summarizes the reference materials acquired in 2000. Digital reference databases are available for both the MMIC library and the MNDM library in Sudbury. Clients may also request inter-library loans and transfers from other MMD offices.

The MMIC library also maintains and updates the complete collection of OGS publications, dating from 1891, and most publications of the Geological Survey of Canada (GSC), dating from 1863, that relate to Ontario. Table 5 lists the OGS publications received and Table 6 lists GSC publications acquired during 2000.

MMIC STAFF AND ACTIVITIES

During 2000, MMIC was staffed and supported by 5 members of the Resident Geologist Program.
Ken Steele, Southwestern Ontario District Geologist provides specific assistance and expertise regarding the geology, resources and minerals industry in Southwestern Ontario. Jennifer Stewart and Heather MacDonald shared the duties of the Southwestern Ontario District Support Geologist from January to August, 2000. Charley Lee, Regional Support Geologist for Southern Ontario, provides lead support for the delivery of ERLIS services and library functions. Inquiry Clerk Jennifer John maintains publication inventories and provides primary reception/front counter client services. Bill McGuinty, Industry Liaison Geologist (ILG), provides assistance to minerals industry clients in accessing geoscience and mineral related expertise and policy information from the Ministry of Northern Development and Mines as well as other pertinent industry information. In his role as liaison, he serves as a primary contact person for information flow and exchange between the minerals industry, its related client associations and MNDM regarding new government initiatives or other issues that may affect mineral investment and the success of exploration and mining in the province.

The Mines and Minerals Information Centre benefited from the assistance of two Ontario Summer Experience Program students, Julie Saccone and Shawn Parry, and Ontario - Quebec Exchange Program student Pascale Sergerie during the summer period. These students provided support to public outreach projects that MMIC and the Southwestern Ontario District Geologist office were undertaking and gained a knowledge of the operations of the Ontario Geological Survey through working with staff and assisting clients at MMIC.

MMIC staff responded to approximately 3,900 client inquiries during 2000 (Table 1). Although primarily a source of information for mineral industry clients such as geologists, geoscientists, engineering and consulting firms and other government agencies, MMIC clients also include students from elementary to university levels, teachers, land use planners and the general public. In addition to its core geoscience expertise, MMIC provided information about prospecting and mineral exploration activities in Ontario, mining and the environment, land use planning, general geology mineral collecting and requests for earth science education.

During 2000, MMIC experienced a modest increase in walk-in client services while a significant drop in telephone inquiries was recorded relative to the previous year (down 28%). This reduced activity can be ascribed to the cancellation of the MMIC toll free number and transfer of these services to the Willet Green Miller Centre in Sudbury.

Table 1: MMIC Client Service Statistics – 2000

	Walk-in Clients	Telephone Inquiries	Total
General Information and Publication Sales	1465	1265	2730
ERLIS	749	96	845
Library	276	33	309
Total	2490	1394	3884

Government-to-Government Activities

In support to fostering government-to-government relations during the year, the Regional Support Geologist and the District Support Geologist assisted the Industry Liaison Geologist (ILG) in preparing and delivering presentations to visiting foreign mines ministry officials on missions to Canada related to mines and mineral development. Two delegations from the People's Republic of China, one from the federal Ministry of Land and Resources and one from Henan Province were presented with overviews of mining lands acquisition and tenure management in Ontario and government services to mineral industry clients. Mr. Ron Gashinski, Senior Manager, Mining Lands Section also made a presentation at one of these information sessions.

The Industry Liaison Geologist also coordinated the collection of information about producing mines in Ontario for publication by Natural Resources Canada. The data is destined for use in a series of provincial maps locating mineral operations and aboriginal communities.

The Industry Liaison Geologist provided support to MNDM initiatives and to MNDM's representation of its clients' concerns and ideas to other Government of Ontario ministries and agencies during the year. In the first half of 2000, the Industry Liaison Geologist assisted in the development of Flow-Through Share Tax Incentives and Remote Mines Taxation by the Ministry of Finance. Clients from the junior and senior mining sectors and the financial and legal communities were contacted in order to obtain a broad sampling of industry perspectives on these issues.

Remote mine tax measures were announced in the May 2000 Ontario Budget. New remote mines will enjoy a 10-year mining tax[1] holiday after which time they will pay Ontario mining tax at a preferred rate of 5%. Also announced in the provincial budget was a reduction in the mining tax assessed on current operating mines from 20% to 10% by 2004.

In December, the Ontario Government stated that amendments to the Income Tax Act (Ontario) will be proposed to the legislature in the spring of 2001 to allow a tax credit of 5% of eligible Ontario expenses in relation to flow-through share offerings for eligible Ontario exploration. This credit would provide the same benefits to investors as a tax deduction proposed in the May, 2000 budget. Legislation for this initiative would be effective October 18, 2000, to ensure that individuals who qualify for a newly created 15% federal tax credit of the same date would be able to claim the new Ontario tax credit for the 2000 taxation year.

Industry Liaison Geologist Activities

In support to promoting MNDM activities and initiatives, the Industry Liaison Geologist attended a number of symposia and conferences during the year. Attending these events also facilitated obtaining client interaction and commentary on the state of exploration and development in Ontario, Canada and abroad. The following mineral industry related events were attended:

- Prospectors and Developers Association of Canada Convention (March 2000, Toronto)
- World Mines Ministries Forum (March 2000, Toronto)
- Northeastern Ontario Mines and Minerals Symposium (April 2000, Kirkland Lake)
- Northwestern Ontario Mines and Minerals Symposium (April 2000, Thunder Bay)
- Northeast Investing in Mining Conference (June 2000, New York)
- Engaging Aboriginal Resources Conference (November 2000, Sudbury)
- Ontario Exploration and Geoscience Symposium (December 2000, Toronto)

In addition to these formal events, the Industry Liaison Geologist attended regularly scheduled meetings of several industry related organizations throughout the year, including the Toronto Geological Discussion Group, the Halton Area Geological Society and the Toronto Branch of the Canadian Institute of Mining Metallurgy and Petroleum.

The Industry Liaison Geologist also participated in the organization and delivery of several new initiatives supported or sponsored by MNDM as follows.

World Mines Ministries Forum (WMMF)

The Prospectors and Developers Association of Canada (PDAC) and the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) jointly founded the Mining Millenium 2000 Corporation in October, 1998, with the objective of hosting the Mining Millenium 2000 Convention and Trade Show (MM2000). The convention was held from March 5 to 10, 2000.

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[1] *mining tax as defined in the Mining Tax Act Revised Statutes of Ontario, 1990, Chapter M.15*

The opportunity provided by this venue allowed the governments of Ontario (through the Ministry of Northern Development and Mines) and Canada (through Natural Resources Canada) to work together with the World Bank, the Mining Association of Canada, the CIM and the PDAC to deliver the first World Mines Ministries Forum (WMMF). The MM2000 organizing committee welcomed this addition to the Convention and agreed to participate with infrastructure and organizational support. An organizing committee was struck in early 1999 to design and deliver the WMMF as the first of a possible series of internationally attended events focussing on the issues facing governments and stakeholders in the global minerals industry.

The WMMF Organizing Committee was co-chaired by the Mines and Minerals Division's (MMD) Assistant Deputy Minister Dr. John Gammon. Staff of the MMD Information and Marketing Services Section provided support, as did the Industry Liaison Geologist through coordinating the contracting of expertise required for the meeting as well as supporting communications for organizers and participants before and during the event, and assisting with registration and publications.

The inaugural World Mines Ministries Forum was a great success, attracting over 300 participants from 52 jurisdictions around the world. The Forum provided an international and pan-sectoral venue for mines ministers, government delegates and interested stakeholders to discuss social, environmental and economic issues related to mineral exploration and mining.

WMMF participation was drawn predominantly from government institutions such as mines ministries at the provincial/state and federal levels, the World Bank and the United Nations (68%); the minerals industry (14%); industry associations and non-government, law, economic and aboriginal organizations (18%). Attendees from government, industry and non-government groups were generally at the senior management level (Director, Executive Director, Deputy Minister and Assistant Deputy Minister). Seven senior representatives (Minister, Secretary level) also attended the Forum.

The stated objectives of the World Mines Ministries were:

a) To enable internationally diverse participants to examine together, for the first time, the next generation of issues related to mineral exploration and mining and to share and discuss potential solutions and policy approaches.

b) To foster a consultative process on common interests in sustainable development and to develop and strengthen new global linkages.

c) To direct discussion into specific areas of mutual interest to delegates and generate discussion on several themes, including:

- The Competitiveness of Nations – The Search for Investment Dollars (organized by Aird and Berlis, Toronto) – issues discussed included legal and regulatory framework, policy regime, tax structure, governance issues, government capacity and resources.

- Mining and the Community (organized by the World Bank Group) - issues discussed included small scale mining (artisinal, small-mechanized), mobilizing local capital, socio-economic impacts, indigenous peoples, land access, land title, compensation, involuntary settlement, consultation procedures.

- Sustainable Mineral Development (organized by Natural Resources Canada) - issues discussed included sustainable development, safe use of minerals and metals, mining and the environment, market access, competitiveness and recycling.

- Geological Surveys in the Information Age (organized by the Geological Survey of Canada and the

Geological Survey of British Columbia) – issues discussed included the evolving role of geological surveys, best practices, alternative funding models, geological information as a competitive advantage.

Participants entered workshops pursuant to their own interests. Because of the broad international make-up at the Forum and the even spread of interests, all participants were introduced to new colleagues from outside of their normal contact areas. For example, one breakout group in the Mining and Community Workshop involved the following composition; *Ontario (government), Chile (legal), Manitoba (community), South Africa (government), Canada (2NGOs), Colombia (university), Japan (mining)* in a discussion about First Nations and indigenous communities. Knowledge among the participants was rich and few of the participants had previously been exposed to each other's views. Similar experiences were found among participants in all workshops as noted by the moderators.

Prepared presentations delivered at the WMMF were collected and posted on the Internet at the 2000 World Mines Ministries Forum website http://www.wmmf.org following the conference. Summaries of the 4 workshops were completed after the Forum and also posted on the site for access by participants and anyone else interested in the issues discussed at the Forum.

Restructuring of the Ontario Prospectors Association

Today, 6 regional prospectors and developers associations operate across the province, most being located within historical mining communities. Their current cumulative membership is approximately 1000 members, derived mainly from their local communities and comprised of prospectors, explorationists, local mineral industry service companies and interested local residents. Since 1994, these groups have worked together on issues of common concern through an umbrella organization called the Ontario Prospectors Association (OPA). The member groups of the OPA are:

- The Sault Ste. Marie Prospectors Association (SSMPA)
- The Sudbury Prospectors and Developers Association (SPDA)
- The Northern Prospectors Association (NPA, Kirkland Lake)
- The Northwestern Ontario Prospectors Association (NWOPA, Thunder Bay)
- The Porcupine Prospectors and Developers Association (PPDA, Timmins)
- The Southern Ontario Prospectors Association (SOPA, Bancroft)

In early 2000, the OPA made an application to the Northern Ontario Heritage Fund Corporation (NOHFC), suggesting ways in which the voice of the Ontario prospecting and grassroots exploration sector could be strengthened and made more effective. The proposal also contained ideas about funding mechanisms that would attract investment into this important early stage of the mining sequence.

On March 7th, 2000, the NOHFC Board of Directors agreed to set aside up to 4 million dollars to support the OPA's application. Parliamentary Assistant to the Minister of Northern Development and Mines, Mr. Jerry Ouellette, was named to co-chair a Restructuring Committee to refine the initial OPA proposal and develop a business plan and renewed mandate for the Association. The OPA Restructuring Committee (OPARC) successfully completed its business analysis and received approval for a first installment of $952,000 on Dec. 11th, 2000. The Industry Liaison Geologist provided organizational and resource support to the committee during its deliberations.

The Restructuring Committee met in discussions and planning workshops beginning in May and concluding in August, 2000. In addition to the collective organizational knowledge of the committee members, information and feedback was sought from the membership of the OPA and from members of the mineral exploration community at large. Input was sought by several methods, including:

- Short questionnaires – 96 returned within the allotted timeframe from several hundreds solicited to the

mineral industry community.

- Long questionnaires – 13 responses from approximately 30 sent out to a selected audience.
- Telephone interviews with selected stakeholders for broader input (13 recorded participants)
- Focus Groups – 2 separate meetings on July 13th and 14th, 2000. Participants represented a cross section of the mineral industry community. These groups were composed of individuals who have freely donated their time to mining issues in the province over the past several years.

Distribution of the short survey questionnaire was made to OPA members and to individuals identified through other Ontario-based mineral association mailing lists in order to solicit input from a wide spectrum of industry players. An estimated 1000 people received the survey and 102 responses were received, 96 of which were returned and used within the allotted timeframe for analytical purposes. The survey included 14 questions to gauge recipients' responses on the structure and mandate of a new, revitalized OPA and to assess the needs and potential size of its future membership. The results of 6 of the questions that contributed significantly to the restructuring project are highlighted below.

Survey Questions 1 and 2 (Charts 1 and 2 respectively, Appendix I) sought information on the affiliation of respondents to prospector associations active in Ontario, including all regional prospecting associations and the PDAC. Question 1 asked respondents to identify the memberships they currently retain. Of the 96 respondents tabulated, 72 were members of the PDAC and 84 held memberships in one or more of the regional prospector associations. This provided clues that most respondents had interests at both the local and national levels.

Question 2 asked respondents to identify the number of years of membership they had maintained within the various client associations. Responses indicated that membership to the regional prospector associations is a recent evolution for those surveyed as compared to a longer standing tradition of membership in the PDAC. Membership in regional prospectors groups has grown steadily over the past 15 years when viewed in 5-year increments. These increments correspond to specific events that attracted interest from the exploration community at large into the northern regions of the province. Notably, the MEDA enhanced flow-through share financing era of the mid- to late eighties, awareness campaigns in the early to mid-nineties such as Save our North, and the advent of prospector association-hosted regional Mines and Mineral Symposia beginning in 1995. Each of these events appears to have played a role in bringing new members to local associations. In the case of survey respondents who are members of the PDAC, their membership profile appears to be more mature, corresponding well to the consistent strength of this organization over the last 4 decades.

Survey Question 4 (Chart 3, Appendix I) asked respondents to indicate from a prepared list what benefits the restructured OPA could provide to its members in terms of activities or products. The list was drawn from activities that the OPA and its member associations are currently engaged in and was designed to provide information to help the organization focus its future efforts. Respondents were asked to identify as many activities as they felt were important. Although it was anticipated that lobbying efforts would factor prominently, other benefits were more sought after by respondents. In particular, communication products such as newsletters and reports on issues, as well as educational and networking opportunities such as geoscience symposia were strongly identified.

Survey Questions 9 and 10 (Charts 4 and 5 respectively, Appendix I) asked respondents to identify issues and trends that would impact exploration in Ontario and to identify where the OPA should direct its advocacy efforts. Less than half of the respondents answered these 2 questions. Of those who did respond to Question 9, investor confidence and land access were predicted to be the most important issues for the coming decade. Written comments identified alternative investment opportunities, changed mineral exploration and deposit acquisition behaviors by large companies and negotiations with First Nations among future challenges. Results from Question 10 indicated that the OPA should deal with investor confidence and land access, as well as influence government policy and activities and play a role in changing public perception of the mineral sector.

Survey Question 8 (Chart 6, Appendix I) addressed the issue of the respondent's interests in participating in activities of the OPA. It also attempted to gauge the respondent's willingness to accept an active role within the operation of the organization. Approximately 40% of respondents indicated they would be passive members. The remaining 60% indicated they would be prepared to participate at a higher level of activity.

Ontario Exploration and Geoscience Symposium, 2000

The Ontario Prospectors Association hosted a very successful, first annual Ontario Exploration and Geoscience Symposium in Toronto on December 11th and 12th, 2000. The Ministry of Northern Development and Mines supported this event by supplying conference facilities at the Macdonald Block, 900 Bay Street in Toronto, as well as presenting geoscience talks and poster displays. In addition to the 2 day symposium, the OPA offered a 1 day short course on "Field Characteristics of VMS Deposits".

The Industry Liaison Geologist provided support for the Symposium and short course through coordinating facilities, catering, publication of materials, as well as mail and Internet promotion.

The Canadian Exploration Geophysicists Society (KEGS) ran a concurrent, 1-day symposium entitled "Near Surface Environmental and Engineering Geophysics" on December 11th in adjacent meeting rooms at the Macdonald Block. Registration and talk schedules for both events were organized and run separately, however, coffee breaks and social activity schedules were coordinated and both groups allowed respective delegates to attend each other's talks and view each other's displays.

More than 350 delegates registered for the OPA geoscience symposium. Forty-one poster and 22 booth displays highlighting government geology, geophysics and client service projects; private sector exploration projects; and service industries available in Ontario were offered, as well as 31 geoscience and industry talks. Forty-eight participants attended the VMS short-course and 75 registrants participated in the KEGS Symposium, which consisted of 18 talks on geophysical methods, 10 displays and 4 poster presentations.

Hardcopy and electronic mailing lists used for symposium promotion were assembled from regional prospector associations and recently published sources of mineral industry companies, professionals and participants. In total, approximately 4200 addresses of individuals and companies that are either Ontario-based or operate within the province were compiled.

Land Use Planning Activities

In support to protecting mineral resource interests, MMIC staff provided updated information and referrals regarding the implementation of *Ontario's Living Legacy* land use strategy. Maps and *Living Legacy* backgrounder information for designated protected areas were made available to walk-in clients and Internet information resources were provided to telephone inquiries. Client concerns related to the strategy are now being referred to newly appointed Regional Land Use Geologists within the Resident Geologist Program for integration into the Ministry's ongoing participation in this initiative.

Education Activities

MMIC Summer Experience students assisted the Southwest District Geologist and the District Support Geologist in collecting materials for the preparation of "Deeper and Deeper", an educational product designed by the Prospectors and Developers Association of Canada to assist Ontario public school teachers in delivering the revised earth sciences curriculum.

Many educators in the Ontario elementary school systems, particularly those teaching grades 4 and 7, contacted MMIC for resource materials to assist in the design of geoscience education components. Approximately 50 kits containing information about Ontario mines and mineral products, geoscience, geology, rocks and minerals were provided on request. Additional sources of relevant earth science information were also provided.

The Southwestern Ontario District Geologist and District Support Geologist and the Industry Liaison Geologist contributed to and participated in the MM2000 Children's Program during the MM2000 convention. The event included an IMAX screening of Gold Fever and a series of activities at the MM2000 Convention such as gold panning, mineral identification, find the pencil (graphite test), scratch testing and magnetic prospecting. This was the first such event directed at young people during the annual Prospectors and Developers Convention in recent history and was very well received by the attending public.

ACKNOWLEDGEMENTS

The authors gratefully acknowledge the insights and efforts of the clients of the Mines and Minerals Information Centre who shared their observations with staff in order to contribute to improving services provided by MMIC and other MNDM divisions. Such interactions assist in building the broad-based knowledge resource required by MNDM to enhance mineral sector competitiveness and ensure the sustainable development of Ontario's mineral resources. The authors also recognize and deeply appreciate the efforts of Jennifer John, Ken Steele, Jennifer Stewart, Heather MacDonald, Julie Saccone, Shawn Parry and Pascale Sergerie for their support and assistance in delivering program activities and client services at MMIC during the past year.

Table 2. Newsletters Received by MMIC Library in 2000

Title
Alaska GeoSurvey News – Newsletter, Alaska Division of Geological & Geophysical Surveys
AusGeo News - Australian Geological Survey Organization
Bearsh' t & Blueberries – Northwestern Ontario Prospectors Association
Canadian Copper - Canadian Copper & Brass Development Association
CANQUA Newsletter – Canadian Quaternary Association
Can Safe - Mining and Mineral Sciences Laboratories Newsletter, Natural Resources Canada
EON - The Newsletter of the Paleontology Division of the Geological Association of Canada
Explore – Newsletter for the Association of Exploration Geochemists
GEOLOG – News Magazine of the Geological Association of Canada
George Cross News Letter
ICME Newsletter – International Council on Metals and the Environment
Iowa Geology - Iowa Department of Natural Resources
Kaiser Bottom Fishing Report
Lunar and Planetary Information Bulletin - Lunar and Planetary Institute
Mineralogical Association of Canada Newsletter
Mining Matters & Mining in Ontario – Ontario Mining Association
Nevada Geology - Newsletter of the Nevada Bureau of Mines and Geology
Newsletter – Environmental Earth Sciences Division GAC
Nova Scotia Minerals Update – Nova Scotia Natural Resources
Ohio Geology - Ohio Department of Natural Resources
OPI Newsletter - Ontario Petroleum Institute Inc.
Outlook - Missouri Department of Natural Resources
PDAC in Brief – Prospectors and Developers Association of Canada
R & D - Research and Development at the Alberta Research Council
Rock Chips - Alberta Geological Survey
Safety Focus - Mines and Aggregates Safety and Health Association
The Explorationist – Newsletter of the Ontario Prospectors Association
The Geologic Record - Kansas Geological Survey
Washington Geology - Washington State Department of Natural Resources
Wat on Earth - University of Waterloo Department of Earth Sciences

Table 3. Journals and Periodicals Received by MMIC Library in 2000

Title
Canadian Aggregates and Roadbuilding Contractor
Canadian Journal of Earth Sciences
Canadian Mining Journal
Canadian Mining and Metallurgical Bulletin - Canadian Institute of Mining, Metallurgy and Petroleum
Economic Geology – Bulletin of the Society of Economic Geologists
Engineering and Mining Journal
Exploration and Mining Geology – Journal of the Geological Society of CIM
Géographie Physique et Quaternaire
Geoscience Canada
Geotimes – News and Trends in Geoscience - American Geological Institute
Heavy Construction News Industrial Minerals
Journal of Geochemical Exploration – Elseiver
Mineralogical Association of Canada – The Canadian Mineralogist
Mining and Exploration Company Financings - Gamah International Limited
Mining Journal
Mining Magazine
Mining Review – British Columbia and Yukon Chamber of Mines
Mining Voice – National Mining Association
North American Minerals News – Industrial Minerals Markets of USA, Canada, Mexico and the Caribbean
Northern Miner
Northern Ontario Business
The Ontario Prospector

Table 4. Selected New Reference Publications Received by the MMIC Library in 2000

Title	Author	Type and Year of Publication
Aggregate Industry Safe Work Practices	Aggregate Producer's Association of Ontario and Mines and Aggregates Safety and Health Association	Booklet, MASHA/APAO, 74p., 2000
Groundwater resources of Delaware County, Pennsylvania	Balmer, T.W. and Davis, D.K.	Water Resources Report 66, 4th series, Pennsylvania Geological Survey, Harrisburg, PA, 67p., 1996
Directory of the non-fuel-mineral producers in Pennsylvania	Barnes, J.H.	Directory, 4th series, Pennsylvania Geological Survey, Harrisburg, PA, 295p., 1997
Rocks and minerals of Pennsylvania	Barnes, J.H.	Educational Series 1, 4th series, Pennsylvania Geological Survey, Harrisburg, PA, 40p., 1991
The geological story of Pennsylvania	Barnes, J.H. and Sevon, W.D.	Educational Series 4, 4th series, Pennsylvania Geological Survey, Harrisburg, PA, 44p., 1996
Proceedings of the 33rd Forum on the Geology of Industrial Minerals	Belanger, M., Clark, T. and Jacob, H-L. (eds.)	CIM Special Volume 50, Canadian Institute of Mining, Metallurgy and Petroleum, Montreal, 288p., 1998
Stratigraphic correlation chart of Pennsylvania	Berg, T.M., McInerney, M.K., Way, J.H. and MacLachlan, D.B.	General Geology Report 75, 4th series, Bureau of Topographic and Geologic Survey, Harrisburg, PA, 1 sheet, 1983
Coal Resources of Indiana County, Pennsylvania Part 1. Coal crop lines, mined-out areas, and structure contours	Bragonier, W.A. and Glover, A.D.	Mineral Resources Report 98, 4th series, Pennsylvania Geological Survey, Harrisburg, PA, 126p., 1996
Field Geology of New South Wales	Branagan, D.F. and Packham, G.H.	3rd Edition, New South Wales Department of Mineral Resources, Sydney Australia, 418p., 2000
Ricketts Glen State Park, Luzerne, Sullivan, and Columbia Counties - The rocks, the Glens, and the falls	Braun, D.D. and Inners, J.D.	Park Guide 17, 4th series, Pennsylvania Geological Survey, Harrisburg, PA, 12p., 1998
Geology and the Gettysburg Campaign	Brown, A.	Educational Series 5, Pennsylvania Geological Survey, Harrisburg, PA, 14p., 1997
Western Australian Industrial Minerals Review 1999	Cameron, E., Thomson, C. and Eaton, D.	Department of Resources Development, Perth W. Aust., 73p., 1999
Mineral Development and the Forest Management Planning Process in Ontario: Getting Involved & The Benefits of Being Involved	Christianson, D.E.	Booklet, Northwestern Ontario Prospectors Association, 2000
Oil Heritage Tour of Lambton County: The Birthplace of the Canadian Oil Industry	Cochrane, R.O. and Fairbank, C.O.	Field Trip Lambton County, Ontario Petroleum Institute Inc., London, Ontario, 74p. with appendices and pullout map, 2000
Preliminary Cargelligo Geological Sheet	Colquhoun, G.P., Cameron, R.G. and Meakin, N.S.	Cargelligo 8131, scale 1:100 000, Geological Survey of New South Wales, Sydney Australia, 1999
Carbonate Cores of the Middle Ordovician Trenton and Black River Groups of Southwestern Ontario	Colquhoun, I.M. and Trevail, R.A.	Core Workshop Oil Gas and Salt Resources Library, Ontario Petroleum Institute Inc., London, Ontario, 54p with inserts, 2000
Platinum 2000 Interim Review	Cowley, A. and Steel, M.	Platinum Report, Johnson Matthey, Public Limited Company, London England, 28p., 2000
Oil and gas developments in Pennsylvania in 1991	Cozart, C.L. and Harper, J.A.	Progress Report 205, 4th series, Pennsylvania Geological Survey, Harrisburg, PA, 96p., 1993
Coal	Crowell, D.L.	Revised Edition, Educational Leaflet No. 8, Ohio Division of Geological Survey, 1998
Sampling the layer cake that isn't: The stratigraphy and paleontology of the type-Cincinnatian	Davis, R.A. and Cuffey, R.J. (eds.)	Guidebook No. 13, Ohio Division of Geological Survey, Columbus Ohio, 194p., 1998
Landslide susceptibility in the Williamsport 1 – by 2 – degree Quadrangle, Pennsylvania	Delano, H.L. and Wilshusen, J.P.	Environmental Geology Report 9, 4th series, Pennsylvania Geological Survey, Harrisburg, PA, 200p., 1999

The geology of Pennsylvania's groundwater	Fleeger, G.M.	Educational Series 3, 4th series, Pennsylvania Geological Survey, Harrisburg, PA, 34p., 1999
Quaternary geology along the Eastern margin of the Scioto lobe in Central Ohio	Frolking, T.A. and Szabo, J.P.	Guidebook No. 16, Ohio Division of Geological Survey, Columbus Ohio, 40p., 1999
Canadian Mines Handbook 2000-01	Giancola, D. (ed.)	Southam Mining Group, Toronto, 560p., 2000
1998 Canadian Minerals Yearbook Review and Outlook	Godin, E. (ed.)	Minerals and Metals Sector, Natural Resources Canada, Ottawa, 1999
Preliminary Stability Evaluation: Unattended Tailings Sites, Ontario. V.1 Prioritization Study	Golder Associates Ltd.	Final report, Golder Associates Ltd., Mississauga ON, 1991
Preliminary Stability Evaluation: Unattended Tailings Sites, Ontario. V.2 Inspection of High Priority Sites	Golder Associates Ltd.	Report, Golder Associates Ltd., Mississauga ON, 1991
Pennsylvanian cephalopods of Ohio	Hackathorn, M. (ed.)	Bulletin 71, Ohio Division of Geological Survey, Columbus Ohio, 260p., 1998
Geology along the towpath: Stones of the Ohio & Erie and Miami & Erie canals	Hannibal, J.T.	Guidebook No. 14, Ohio Division of Geological Surveys, Columbus Ohio, 60p., 1999
The Giant Kidd Creek volcanogenic massive sulfide deposit, Western Abitibi Subprovince, Canada	Hannington, M.D. and Barrie, C.T. (eds.)	Economic Geology Monograph 10, Economic Geology Publishing Co., Inc., Littleton CO, 672p., 1999
Earthquakes in Ohio	Hansen, M.C.	Revised Edition, Educational Leaflet No. 9, Ohio Division of Geological Survey, 2000
The Ice Age in Ohio	Hansen, M.C.	Revised Edition, Educational Leaflet No. 7, Ohio Division of Geological Survey, 1997
Oil Creek State Park, Venango County - Ice and oil shape the land	Harper, J.A.	Park Guide 22, 4th series, Pennsylvania Geological Survey, Harrisburg, PA, 12p., 1998
Mines and Wines - Industrial Minerals and Rocks, Geology and Wineries of the Niagara Region	Haynes, S.J. and Steele, K.G.	Field Trip Guide Book, Canadian Institute of Mining, Metallurgy and Petroleum (CIM) - Industrial Minerals Division and Toronto Branch, 25p., 2000
Mining Annual Review 1999	Hinde, C. (ed.)	Mining Journal Ltd., London UK, 380p., 1999
Mining Centres of the World – Toronto: Finance Capital	Hinde, C. and Williams, L. (eds.)	Supplement, The Mining Journal Ltd., London UK, 50p., 2000
Common Fossils of Pennsylvania	Hoskins,D.M.	Educational Series 2, 4th series, Pennsylvania Geological Survey, Harrisburg, PA, 19p., 1999
Geology and mineral resources of the Allenwood and Milton Quadrangles, Union and Northumberland Counties, Pennsylvania	Inners, J.D.	Atlas 144cd, 4th series, Pennsylvania Geological Survey, Harrisburg, PA, 135p. + 3 Plates, 1997
2000/01 CAMESE Compendium of Canadian Mining Suppliers	J.G. Baird, Director	The Canadian Association of Mining Equipment and Services for Export, Markham Ontario, 162p., 2000
Industrial Minerals Directory: A world guide to producers and processors	Keegan, N. (ed.)	Fourth edition, Industrial Minerals Information Ltd, Surrey UK, 622p., 1999
Raw Materials for Pigments, Fillers & Extenders	Keegan, N. (ed.)	3rd edition, Industrial Minerals Information Limited, Surrey UK, 114p., 2000
Sinkholes in Pennsylvania	Kochanov, W.E.	Educational Series 11, 4th series, Pennsylvania Geological Survey, Harrisburg, PA, 33p., 1999
Manitoba Annual Report 1999-2000	Manitoba Industry, Trade and Mines	Annual Report, Manitoba Industry, Trade and Mines, Winnipeg, Manitoba 126p., 2000
Geology of the Dunkard Group (Upper Pennsylvanian-Lower Permian) in Ohio, West Virginia, and Pennsylvania	Martin, W.D.	Bulletin 73, Ohio Division of Geological Survey, Columbus Ohio, 49p., 1999
Groundwater resources of Cambria County, Pennsylvania	McElroy, T.A.	Water Resources Report 67, 4th series, Pennsylvania Geological Survey, Harrisburg, PA, 49p., 1998
Field Manual Occupational Health and Safety Act and Regulations for Surface and Underground Diamond Drillers	Mines and Aggregates Safety and Health Association	Document, MASHA, North Bay Ontario, 82p., 1998
Sedimentology and provenance of Carboniferous and Permian rocks of Athens County, Southeastern Ohio	Nadon, G.C., Gierlowski-Kordesch, E.H. and Smith, J.P.	Guidebook No. 15, Ohio Division of Geological Survey, Columbus Ohio, 23p., 1999
Ontario Mining & Exploration Directory 2000	Norman, D. (ed.)	Directory, Naylor Publications Company (Canada), Winnipeg Manitoba, 42p., 2000

Fused Minerals: Supply, grades & markets	O'Driscoll, M. (ed.)	Industrial Minerals special review, Metal Bulletin plc, Surrey UK, 54p., 2000
Quaternary geology of Ohio	Pavey, R.R., Goldthwait, R.P., Brockman, C.S	Map No.2, Ohio Division of Geological Survey, scale 1:500 000, 1999, also with ., Hull, D.N., Mac Swinford, E. and Van Horn, R.G. (comps.)
Mining Millennium 2000: International Convention & Trade Exhibition	PDAC, CIM	Mining Millennium 2000 (MM2000), Content Management Corp., Richmond Hill Ontario, 1 CD-ROM, 2000
Mining and Mineral Processing Operations in Canada 1999	Ralph, L. and Maglaras, M.	Minerals and Metals Sector, Natural Resources Canada, Ottawa, 83p., 2000
Recommendations for Exploration 2000	Resident Geologist Program Staff	Ministry of Northern Development and Mines, 12p., 2000
Ordovician and Silurian Rocks and Fossils of the Southern Georgian Bay Area, Ontario	Rudkin, D., Stott, C., Tetreault, D. and Rancourt, C.	Field Trip Guidebook No. 7, Geological Association of Canada, St. John's. Newfoundland, 47p., 1998
Mining Journal: 2000 Mining Sourcebook	Scales, M. (ed.)	109th Edition, Southam Magazine Group, Toronto, 138p., 2000
Pennsylvania and the Ice Age	Sevon, W.D. and Fleeger, G.M.	Educational Series 6, 4th series, Pennsylvania Geological Survey, Harrisburg, PA, 30p., 1999
Regional bedrock geology of the Marion, Ohio, 30x 60 minute quadrangle	Shrake, D.L.	Map No.9, Ohio Division of Geological Survey, scale 1:100 000, 1997
Lightening the Lode: A Guide to Responsible Large-scale Mining	Rosenfeld-Sweeting, A. and Clark, A.P.	CI Policy Papers, Conservation International, Washington DC, 113p., 2000
Depositional Environments and Paleoecology of Middle and Upper Devonian Strata in Southwestern Ontario	Tsujita, C.J. and Tetreault, D.K.	Guidebook AAPG Field Trip #3, Ontario Petroleum Institute Inc., London, Ontario, 45p., 2000
The Statesman's Yearbook 1998-99: The Essential Political and Economic Guide to all the Countries of the World	Turner, B. (ed.)	135th Edition, St. Martin's Press, Inc., New York, 1815p., 1998
Hydrogeology and groundwater quality of the glaciated valleys of Bradford, Tioga, and Potter Counties, Pennsylvania	Williams, J.H., Taylor, L.E. and Low, D.J.	Water Resources Report 68, 4th series, Pennsylvania Geological Survey, Harrisburg, PA, 89p., 1998
A Guide to Staking Mining Claims		Ministry of Northern Development and Mines, 37p., 2000
Aggregate Resources of Ontario: Provincial Standards		Version 1.0, Ministry of Natural Resources, Peterborough ON, 1997
Exploration for the Platinum – Group Elements in Ontario		Ministry of Northern Development and Mines, 9p., 2000
Guide de jalonnement des claims miniers		Ministère du Développement du Nord et des Mines de l'Ontario, 37p., 2000
L'Activité Métallurgique au Canada: Fer et Acier de Première Fusion		MR 250, Secteur des Minéraux et des Métaux, Ressourses naturelles Canada, Ottawa, 42p., 2000
Metallurgical Works in Canada: Primary Iron and Steel		MR 250, Minerals and Metals Sector, Natural Resources Canada, Ottawa, 38p., 2000
Mining & Exploration Northeastern Ontario Summary – 2000		Ministry of Northern Development and Mines, 19p., 2000
Ontario Mineral and Exploration Statistics Statistiques minières et d'exploration de l'Ontario 1999		Ministry of Northern Development and Mines, Queen's Printer for Ontario, 86p., 2000
Ontario, a World Leader in Mining: Explore the Opportunities		Ministry of Northern Development and Mines, Queen's Printer for Ontario, 24p., 2000
Overview of Trends in Canadian Mineral Exploration 1999		Canadian Intergovernmental Working Group on the Mineral Industry, Ottawa, 124p., 2000
Southern Ontario Resident Geologist Program Source Book		Ministry of Northern Development and Mines, 15p., 2000
Where will you find your next mine? The Ontario Government's OPERATION TREASURE HUNT		Mining in Ontario. The future is here. Ministry of Northern Development and Mines, 7p., 2000

Table 5. Selected Ontario Geological Survey Publications Received by MMIC Library in 2000

Title	Author	Type and Year of Publication
Lithostratigraphic Logging of Six Bedrock Boreholes in the Rouge River Valley, Southern Ontario	Armstrong, D.K.	Ontario Geological Survey, Open File Report 6038, 39p., 2000
Paleozoic Geology of the Northern Lake Simcoe Area, South-Central Ontario	Armstrong, D.K.	Ontario Geological Survey, Open File Report 6011, 52p., 2000
Report of Activities 1999, Resident Geologist Program, Timmins Regional Resident Geologist Report: Timmins-Sault Ste. Marie Districts	Atkinson, B.T., Hailstone, M.H., Ravnaas, C.B., Wilson, A.C., Draper, D.M., Hope, P., Morra, P.M. and Beauchamp, S.A.	Ontario Geological Survey, Open File Report 6006, 108p., 2000
Geological compilation of the Kirkland Lake area, Abitibi Greenstone Belt	Ayer, J.A. and Trowell, N.F.	Ontario Geological Survey, Preliminary Map P.3425*, scale 1:100 000, 2000
Summary of Field Work and Other Activities 2000	Ayer, J.A., Baker, C.L., Kelly, R.I., Parker, J.R. Stott, G.M. and Thurston, P.C. (eds.)	Ontario Geological Survey, Open File Report 6032, 390p., 2000
Quaternary Geology, Peterlong Lake Area	Bajc, A.F.	Ontario Geological Survey, Map 2611, scale 1:50 000, 2000
Quaternary Geology, Radisson Lake Area	Bajc, A.F.	Ontario Geological Survey, Map 2610, scale 1:50 000, 2000
Results of Regional Till Sampling in the Western Part of the Shebandowan Greenstone Belt, Northwestern Ontario	Bajc, A.F.	Ontario Geological Survey, Open File Report 6012†, 82p., 2000
Geochemical Response of Surficial Media, North and East Ranges, Sudbury Basin	Bajc, A.F. and Hall, G.E.M.	Ontario Geological Survey, Open File Report 6033†, 265p., 2000
Quaternary geology of the Kirkland Lake area	Baker, C.L.	Ontario Geological Survey, Map 2649, scale 1:50 000, 2000
Quaternary geology of the Ramore area	Baker, C.L.	Ontario Geological Survey, Map 2650, scale 1:50 000, 2000
Quaternary Geology, Larder Lake Area	Baker, C.L.	Ontario Geological Survey, Map 2647, scale 1:50 000, 2000
Quaternary Geology, Magusi River Area	Baker, C.L.	Ontario Geological Survey, Map 2648, scale 1:50 000, 2000
Upper Vermilion River Watershed: Stream Sediment, Outwash, Till and Esker Sediment Sampling Survey	Barnett, P.J.	Ontario Geological Survey, Open File Report 6002, 75p., 2000
Geology of the Kamiskotia Area	Barrie, C.T.	Ontario Geological Survey, Study 59, 79p., 2000. Accompanied by Map P.3396
Geology of the Kamiskotia Area	Barrie, C.T.	Ontario Geological Survey, Preliminary Map P.3396, scale 1:50 000, 2000
Geology of the Monteith Area	Berger, B.R.	Ontario Geological Survey, Open File Report 6024, 77p., 2000. Accompanied by Map P.3367
Geology of Tully and Little Townships	Berger, B.R.	Ontario Geological Survey, Open File Report 6025, 73p., 2000. Accompanied by Map P.3351
Precambrian Geology of the Ghost Range Area	Berger, B.R.	Ontario Geological Survey, Map 2563, scale 1:50 000, 2000
Precambrian Geology of the Hislop Township Area	Berger, B.R.	Ontario Geological Survey, Map 2527, scale 1:20 000, 2000
Precambrian Geology of the Separation Lake Area, Northwestern Ontario	Blackburn, C.E. and Young, J.B.	Ontario Geological Survey, Open File Report 6001, 94p., 2000. Accompanied by OFMs 241 and 242
Regional Geology of the Sioux Lookout Orogenic Belt, Western Wabigoon Subprovince: Stages of Archean Volcanism, Sedimentation, Tectonism and Mineralization	Devaney, J.R.	Ontario Geological Survey, Open File Report 6017, 158p., 2000. Accompanied by Map P.3342

Armstrong-Lake Nipigon area lake sediment survey: Operation Treasure Hunt – Area C	Dyer, R.	Ontario Geological Survey, Open File Report 6027†, 96p., 2000
Foleyet-Missinaibi Area Lake Sediment Survey: Operation Treasure Hunt-Area A	Dyer, R.	Ontario Geological Survey, Open File Report 6014, 122p., 2000
Nakina-Longlac Area Lake Sediment Survey: Operation Treasure Hunt-Area B	Dyer, R.	Ontario Geological Survey, Open File Report 6035†, 144p., 2000
Precambrian Geology, Street Township	Easton, R.M. and Murphy, E.I.	Ontario Geological Survey, Preliminary Map P.3427, scale 1:20 000, 2000
Aggregate resources inventory of Victoria County	Geomatics International Limited and Rowell, D.J.	ARIP 168, 81p., 2000. Accompanied by four maps* ARIMs 168-1A, -2A, -1B, -2B
Precambrian Geology, Garden Lake Area	Hart, T.R.	Ontario Geological Survey, Open File Report 6037, 82p., 2000. Accompanied by Maps P.3422 and P.3423
Precambrian Geology, Garden Lake Greenstone Belt (East Half)	Hart, T.R.	Ontario Geological Survey, Preliminary Map P.3423, scale 1:20 000, 2000
Precambrian Geology, Garden Lake Greenstone Belt (West Half)	Hart, T.R.	Ontario Geological Survey, Preliminary Map P.3422, scale 1:20 000, 2000
Report of Activities 1999, Resident Geologist Program, Red Lake Regional Resident Geologist Report: Red Lake-Kenora Districts	Hinz, P., Storey, C.C., Gosselin, S.D.M., Blackburn, C.C. and Kosloski, L.	Ontario Geological Survey, Open File Report 6003, 66p., 2000
Garden-Obonga Lake Area Lake Sediment Survey: Au and PGE data: Operation Treasure Hunt	Jackson, J	Ontario Geological Survey, Open File Report 6028†, 76p., 2000
Mishibishu Lake Area High Density Regional Lake Sediment and Water Geochemical Survey, Northern Ontario	Jackson, J.E.	Ontario Geological Survey, Open File Report 6039†, 74p., 2000
Garden-Obonga Lake Area High Density Lake Sediment and Water Geochemical Survey, Northwestern Ontario	Jackson, J.E. and Dyer, R.D.	Ontario Geological Survey, Open File Report 6009†, 107p., 2000
Precambrian Geology, Shining Tree Area (West Half)	Johns, G.W.	Ontario Geological Survey, Preliminary Map P.3420, scale 1:50 000, 2000
Precambrian Geology, Bannockburn Area	Lumbers, S.B. and Vertolli, V.M.	Ontario Geological Survey, Preliminary Map P.3402, scale 1:50 000, 2000
Precambrian Geology, Bracebridge Area	Lumbers, S.B. and Vertolli, V.M.	Ontario Geological Survey, Preliminary Map P.3411, scale 1:50 000, 2000
Precambrian Geology, Burleigh Falls Area	Lumbers, S.B. and Vertolli, V.M.	Ontario Geological Survey, Preliminary Map P.3404, scale 1:50 000, 2000
Precambrian Geology, Campbellford Area	Lumbers, S.B. and Vertolli, V.M.	Ontario Geological Survey, Preliminary Map P.3406, scale 1:50 000, 2000
Precambrian Geology, Coe Hill Area	Lumbers, S.B. and Vertolli, V.M.	Ontario Geological Survey, Preliminary Map P.3403, scale 1:50 000, 2000
Precambrian Geology, Elmvale Area	Lumbers, S.B. and Vertolli, V.M.	Ontario Geological Survey, Preliminary Map P.3408, scale 1:50 000, 2000
Precambrian Geology, Gooderham Area	Lumbers, S.B. and Vertolli, V.M.	Ontario Geological Survey, Preliminary Map P.3405, scale 1:50 000, 2000
Precambrian Geology, Huntsville Area	Lumbers, S.B. and Vertolli, V.M.	Ontario Geological Survey, Preliminary Map P.3413, scale 1:50 000, 2000
Precambrian Geology, Lake Joseph Area	Lumbers, S.B. and Vertolli, V.M.	Ontario Geological Survey, Preliminary Map P.3412, scale 1:50 000, 2000
Precambrian Geology, Orillia Area	Lumbers, S.B. and Vertolli, V.M.	Ontario Geological Survey, Preliminary Map P.3407, scale 1:50 000, 2000
Precambrian Geology, Orrville Area	Lumbers, S.B. and Vertolli, V.M.	Ontario Geological Survey, Preliminary Map P.3414, scale 1:50 000, 2000
Precambrian Geology, Gravenhurst Area	Lumbers, S.B., Vertolli, V.M. and Schwerdtner, W.M.	Ontario Geological Survey, Preliminary Map P.3409, scale 1:50 000, 2000

Precambrian Geology, Penetanguishene Area	Lumbers, S.B., Vertolli, V.M. and Schwerdtner, W.M.	Ontario Geological Survey, Preliminary Map P.3410, scale 1:50 000, 2000
Report of Activities 1999, Resident Geologist program, Thunder Bay North Regional Resident Geologist Report: Thunder Bay North- Sioux Lookout Districts	Mason, J.K., Farrow, D., Seim, G., White, G.D., O'Brien, M.S., Walden, A. and Komar, C.	Ontario Geological Survey, Open File Report 6004, 62p., 2000
Report of Activities 1999, Resident Geologist Program, Kirkland Lake Regional Resident Geologist Report: Kirkland Lake- Sudbury Districts	Meyer, G., Cosec, M., Grabowski, G.P.B., Guindon, D.L., Chaloux, E.C. and Charette, M.	Ontario Geological Survey, Open File Report 6007, 91p., 2000
Kimberlite, Base Metal, Gold and Carbonatite Exploration Targets Derived from Overburden Heavy Mineral Data, Killala Lake Area, Northwestern Ontario	Morris, T.F., Sage, R.P., Crabtree, D.C. and Petrie, S.	Ontario Geological Survey, Open File Report 6013†, 114p., 2000
Geological Compilation of the Eastern Half of the Schreiber-Hemlo Greenstone Belt	Muir, T.L.	Ontario Geological Survey, Map 2614, scale 1:50 000, 2000
A Library of Digital Line Standards	Muir, T.L., Watkins, T.W. and Berdusco, B.J.	Ontario Geological Survey, Open File Report 6026, 208p., 2000. Accompanied by one 3.5 inch diskette
Archean Metallogeny of the Mine Centre-Fort Frances Area	Poulsen, K.H.	Ontario Geological Survey, Report 266, 121p., 2000. Accompanied by Map 2525
Geological Setting of Mineralization in the Mine Centre-Fort Frances Area	Poulsen, K.H.	Ontario Geological Survey, Mineral Deposits Circular 29, 78p., 2000. Accompanied by Map 2525
Precambrian Geology and Mineral Occurrences, Mine Centre-Fort Frances Area	Poulsen, K.H.	Ontario Geological Survey, Map 2525, scale 1:50 000, 2000
Ontario Geological Survey 2000. Airborne magnetic and electromagnetic surveys, Cochrane area	Reford, S. W.	Ontario Geological Survey, Map 82 000 – 82 006, scale 1:20 000, 2000
Ontario Geological Survey 2000. Airborne magnetic and electromagnetic surveys, Vickers area	Reford, S. W.	Ontario Geological Survey, Map 82 145 – 82 149, scale 1:20 000, 2000
Ontario Geological Survey 2000. Airborne magnetic and electromagnetic surveys, Temagami area	Reford, S. W.	Ontario Geological Survey, Map 82 065 – 82 069, scale 1:20 000, 2000
Ontario Geological Survey 2000. Airborne magnetic and electromagnetic surveys, Schreiber area	Reford, S. W.	Ontario Geological Survey, Map 82 073 – 82 083, scale 1:20 000, 2000
Ontario Geological Survey 2000. Airborne magnetic and electromagnetic surveys, Kirkland Lake area	Reford, S. W.	Ontario Geological Survey, Map 82 028 – 82 046, scale 1:20 000, 2000
Ontario Geological Survey 2000. Airborne magnetic and electromagnetic surveys, Garden-Obonga area	Reford, S. W.	Ontario Geological Survey, Map 82 096 – 82 123, scale 1:20 000, 2000
Ontario Geological Survey 2000. Airborne magnetic and electromagnetic surveys, Matheson area	Reford, S. W.	Ontario Geological Survey, Map 82 016 – 82 024, scale 1:20 000, 2000
Quaternary Geology, Porquis Junction Area	Richard, J.A. and McClenaghan, M.B.	Ontario Geological Survey, Map 2659, scale 1:50 000, 2000
Quaternary Geology, Wanabeag River Area	Richard, J.A. and McClenaghan, M.B.	Ontario Geological Survey, Map 2658, scale 1:50 000, 2000
Schreiber-Hemlo Area Lake Sediment Survey: Gold and PGE Data – Operation Treasure Hunt	Russell, D.	Ontario Geological Survey, Open File Report 6036†, 59p., 2000
Kimberlites of the Attawapiskat area, James Bay Lowlands, northern Ontario	Sage, R.P.	Ontario Geological Survey, Open File Report 6019†, 341p., 2000
Kimberlites of the Lake Timiskaming Structural Zone: Supplement	Sage, R.P.	Ontario Geological Survey, Open File Report 6018, 123p., 2000
The "Sandor" Diamond Occurrence, Michipicoten Greenstone Belt, Wawa, Ontario: A Preliminary Study	Sage, R.P.	Ontario Geological Survey, Open File Report 6016, 49p., 2000
Report of Activities 1999, Resident Geologist Program, Southern Ontario Regional Resident Geologist Report: Southeastern and Southwestern Districts, Mines and Minerals Information Centre, and Petroleum Resources Centre	Sangster, P.J., Papertzian, V.C., Steele, K.G., McGuinty, W.J., Lee, C.R., Laidlaw, D.A. and Carter, T.R.	Ontario Geological Survey, Open File Report 6008, 79p., 2000

Report of Activities 1999, Resident Geologist Program, Thunder Bay South Regional Resident Geologist Report: Thunder Bay South District	Schnieders, B.R., Scott, J.F., Smyk, M.C. and O'Brien, M.S.	Ontario Geological Survey, Open File Report 6005, 51p., 2000
Atikokan Area Lake Sediment Survey: Au and PGE Data – Operation Treasure Hunt	Searcy, C.	Ontario Geological Survey, Open File Report 6034†, 62p., 2000
Mining in Ontario the future is here: Exploration Opportunities 2000	Staff of the Ontario Geological Survey	Ontario Geological Survey, Compendium of exploration targets, 2000
Mines and Wines: Industrial Minerals, Geology and Wineries of the Niagara Region-Field Trip Guidebook	Steele, K.G. and Haynes, S.J.	Ontario Geological Survey, Open File Report 6029, 25p., 2000
Geology, Mineral Chemistry and Thermobarometry of the Entwine Stock, Northwest Ontario: Base Metal, Platinum Group Element and Gold Mineralization	Stone, D.	Ontario Geological Survey, Open File Report 6021, 37p., 2000
Precambrian Geology, Bonheur Area	Stone, D. and Hallé, J.	Ontario Geological Survey, Preliminary Map P.3401, scale 1:50 000, 2000
Precambrian Geology, Sherman River Area	Stone, D., Hallé, J. and Lange, M.	Ontario Geological Survey, Preliminary Map P.3418, scale 1:50 000, 2000
Precambrian Geology, Withers Lake Area	Stone, D., Hallé, J. and Lange, M.	Ontario Geological Survey, Preliminary Map P.3419, scale 1:50 000, 2000
The Distribution of Gold Grains in Till, Sachigo River Mine, Northwest Ontario	Stone, D., Hallé, J. and Lange, M.	Ontario Geological Survey, Open File Report 6015, 17p., 2000
Precambrian Geology, Petry River Area	Stone, D., Hallé, J. and Petersen, N.	Ontario Geological Survey, Preliminary Map P.3426, scale 1:50 000, 2000
Precambrian Geology, Marshall Lake Area	Straub, K.H., Stott, G.M. and Phillips, J.	Ontario Geological Survey, Preliminary Map P.3424, scale 1:20 000, 2000
Regional Distribution of Platinum, Palladium, Gold, Kimberlite Indicator Minerals and Base Metals in Surficial Sediments, River Valley Area, Northeastern Ontario	Tardif, N.P.	Ontario Geological Survey, Open File Report 6010†, 106p., 2000
Kimberlite Indicator Minerals from Till Samples in the River Valley-Verner Area, Northeastern Ontario	Tardif, N.P. and Crabtree, D.C.	Ontario Geological Survey, Open File Report 6040†, 61p., 2000
Tantalum mineralogy of rare-element granitic pegmatites from the Separation Lake area, Northwestern Ontario	Tindle, A.G. and Breaks, F.W.	Ontario Geological Survey, Open File Report 6022†, 378p., 2000
Quaternary Geology, Matheson Area	Vagners, U.J.	Ontario Geological Survey, Map 2652, scale 1:50 000, 2000
Quaternary Geology, Lightning River Area	Vagners, U.J. and Courtney, S.J.	Ontario Geological Survey, Map 2651, scale 1:50 000, 2000
Precambrian Geology, Watabeag Lake Area	Vaillancourt, C.	Ontario Geological Survey, Preliminary Map P.3421, scale 1:50 000, 2000

* *Also released in digital form.*
† *Geochemical data / chemical analyses / appendices available in digital form.*

Table 6. Selected Geological Survey of Canada Publications Incorporated into the MMIC Library during 2000.

Title	Author	Type and Year of Publication
Current Research 1999-A&B Cordillera and Pacific Margin and Interior Plains and Arctic Canada	C.A Evenchick et al.	Current Research 1999-A&B, 263p., 1999
Middle Devonian (Givetian, Hamilton Group) ostracoda in two diamond drill cores from Lambton County, Southwestern Ontario	Copeland, M.J.	Bulletin 537, 72p., 1999
World distribution of nickel deposits	Eckstrand, O.R. and Good, D.J. (comp.)	Open File 3791a, 19p. + 3 diskettes, 2000
World distribution of nickel deposits	Eckstrand, O.R. and Good, D.J. (comp.)	Open File 3791b, scale 1:35 000 000, 2000

Mercury Data for Till and Stream Sediments Samples from the Manitouwadge Region, Ontario	Kettles, I.M. and Garrett, R.G.	Open File 3790, 37p., 3 location maps, 2000. Accompanied by one data diskette
Macrofossil, pollen, and geochemical records of peatlands in the Kinosheo Lake and Detour Lake areas, northern Ontario	Kettles, I.M., Garneau, M. and Jetté, H.	Bulletin 545, 28p., 2000
World distribution of porphyry, porphyry-associated skarn, and bulk-tonnage epithermal deposits and occurrences	Kirkham, R.V. and Dunne, K.P.E.	Open File 3792a, 26p. + 1 diskette, 2000
World distribution of porphyry, porphyry-associated skarn, and bulk-tonnage epithermal deposits and occurrences	Kirkham, R.V. and Dunne, K.P.E.	Open File 3792b, scale 1:35 000 000, 2000
Release of high resolution aeromagnetic total field survey of Lake Ontario-New York area	Kiss, F. and Coyle, M.	Open File 3746 a-j, 10 sheets, scale 1:100 000, 2000
Diffusion du levé aérien à haute résolution du champ magnétique total Lac Ontario-État de New York	Kiss, F. et Coyle, M.	Dossier Public 3746 a-j, 10 feuilles, échelle: 1/100 000, 2000
Current Research 1999-C Canadian Shield	L.A. Dredge et al.	Current Research 1999-C, 252p., 1999
Current Research 1999-E	L.S. Lane et al.	Current Research 1999-E, 213p., 1999
Promising new mines in Canada, 1999-2002	Minerals and Metals Sector	Map 2000A, scale 1:6 000 000, 1999
Principal mineral areas of Canada	Minerals and Metals Sector and National Energy Board	Map 900A, Forty-ninth edition, scale 1:6 000 000, 1999
Current Research 2000	Natural Resources Canada - GSC	Articles A1 - A22; B1 - B5; C1 - C24; D1 – D13 and E1 - E15 on 1 CD-ROM, 2000
Current Research 2000 Radiogenic age and isotopic studies: Report 13	Natural Resources Canada – GSC	Articles F1 –F8 on 1 CD-ROM, 2000
Preliminary release of geoscience data, Red Lake greenstone belt, Northwestern Ontario	Panagapko, D.A., Valade, L., Harris, J.R. and Brown, N.	Open File D3751, 1 CD-ROM, 2000
Geological classification of Canadian gold deposits	Poulsen, K.H., Robert, F. and Dube, B.	Bulletin 540, 106p., 2000
Form and sedimentary fill of tunnel channels beneath the Oak Ridges Moraine, southern Ontario: the Holland Marsh – King City Channel System	Russell, H.A.J., Sharpe, D.R., Pullan, S.E. and Barnett, P.J.	Open File 3841, 1 sheet, 2000
Current Research 1999-D Eastern Canada and National and General Programs	S.J. Paradis et al.	Current Research 1999-D, 57p., 1999
Roches et minéraux du collectionneur, Cobalt-Belleterre-Timmins (Ontario et Québec)	Sabina, A.P.	Rapport divers 57, 266p., 2000
Rocks and minerals for the collector, Cobalt-Belleterre-Timmins, Ontario and Quebec	Sabina, A.P.	Miscellaneous Report 57, 266p., 2000
Structural geology, Savant Lake greenstone belt, western Superior Province, Ontario	Sanborn-Barrie, M.	Open File 3947, scale 1:100 000, 2000
Principales régions minières du Canada	Secteur des minéraux et des métaux et Office national de l'énergie	Carte 900A, Quarante-neuvième édition, échelle 1/6 000 000, 1999
Geochemical and lithological data from overburden drill cores, with descriptive core logs, Timmins to Smoky Falls, Ontario	Smith, S.	Open File 2278, 214p., 2000
Peatlands of Canada	Tarnocai, C., Kettles, I.M. and Lacelle, B.	Open File 3834, scale 1:6 500 000, 2000
Wellbore temperature measurements and preliminary interpretation in terms of groundwater movement in the Oak Ridges Moraine, Ontario	Taylor, A., Allen, V., Burgees, M. and Naufal, J.	Open File 3787, 1999
Data for ^{210}Pb dating of four peat cores from the vicinity of Detour Lake and Kinosheo Lake, Ontario, and Fort Simpson, Northwest Territories	Turner, L.J. and Kettles, I.M.	Open File 3858, 78p., 2000
The enigmatic rings of the James Bay Lowlands: a probable geological origin	Veillette, J.J and Giroux, J-F.	Open File 3708, 38p., 1999
Current Research 1999-F Radiogenic age and isotopic studies: Report 12	W. Matthews et al.	Current Research 1999-F, 65p., 1999

APPENDIX 1 - Ontario Prospectors Association Survey Question, Response Charts

Chart 1 – OPA Survey Question 1 – Are you presently a member of:
a) a local prospector's association? b) PDAC?

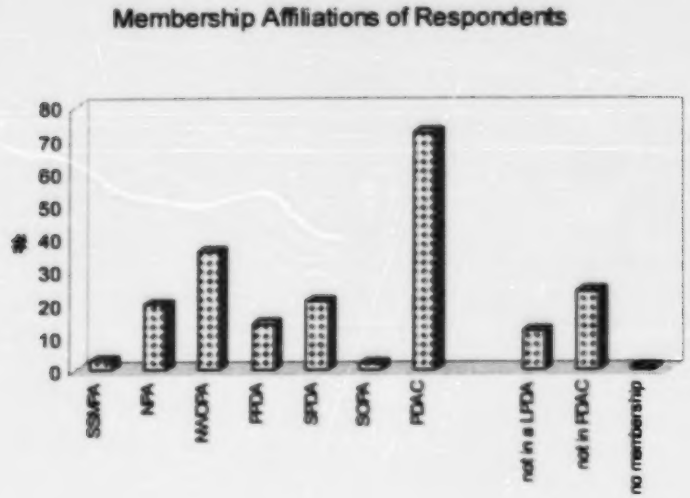
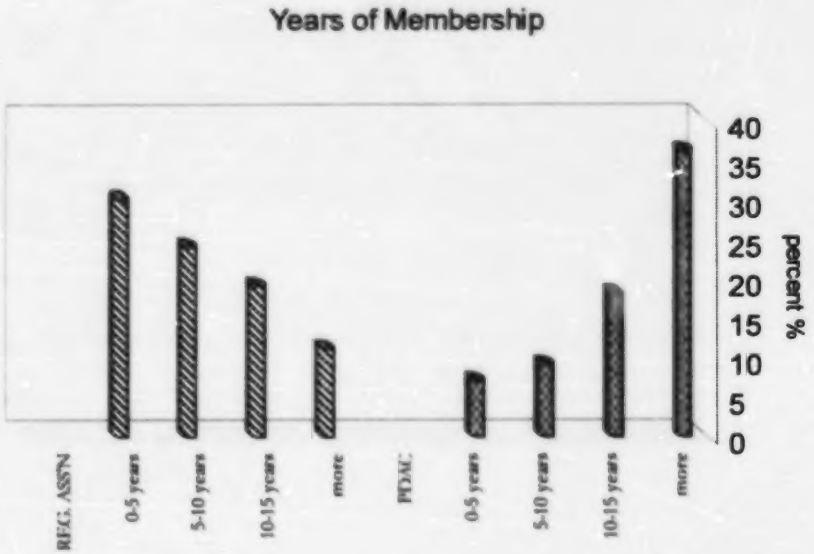


Chart 2 – OPA Survey Question 2 – How long have you been a member of these associations?



APPENDIX 1 - Ontario Prospectors Association Survey Question, Response Charts (cont'd)

Chart 3 – OPA Survey Question 4 – As the OPA moves towards a member-based, province-wide Organization representing the mineral exploration community of Ontario, what benefits would you be interested in receiving as a member?

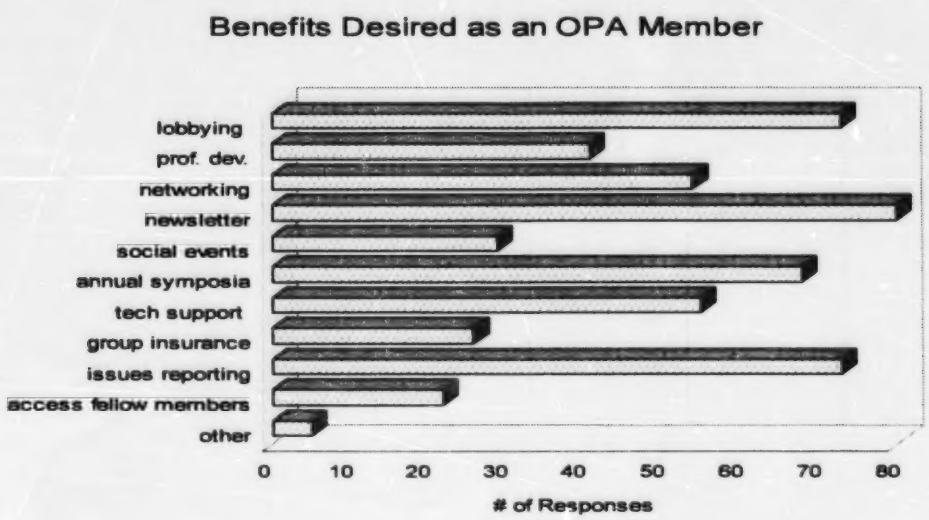
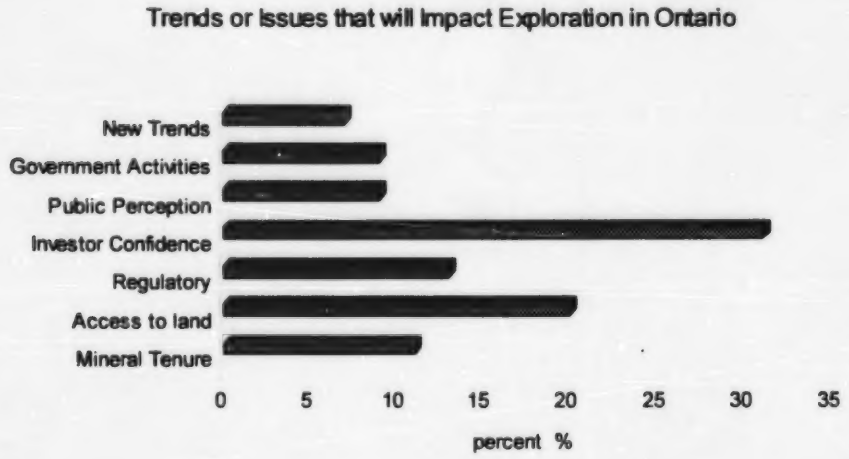


Chart 4 – OPA Survey Question 9 – What trends or issues will have an impact on Exploration in Ontario in the next five to ten years?



APPENDIX 1 - Ontario Prospectors Association Survey Question, Response Charts (cont'd)

Chart 5 – OPA Survey Question 10 – What do you want the new OPA to accomplish as an advocacy organization for grassroots exploration?

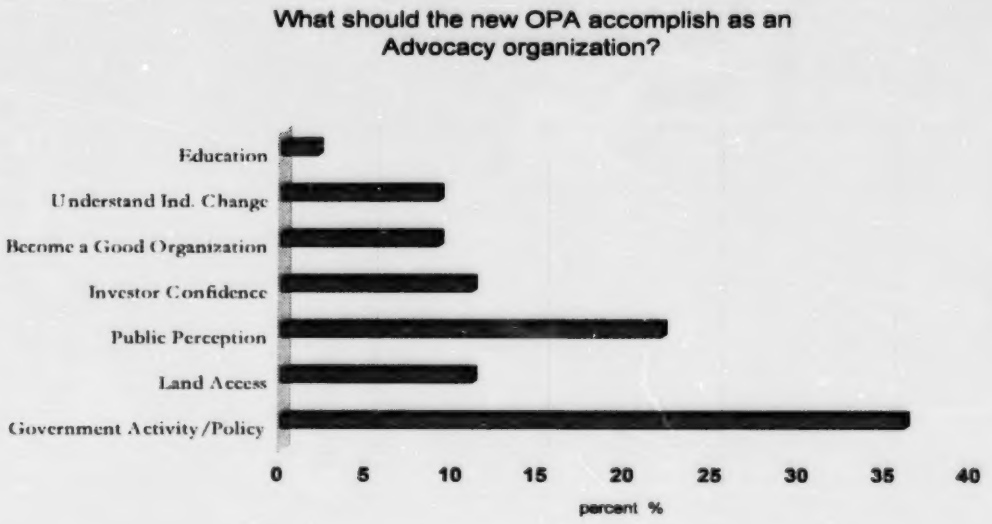
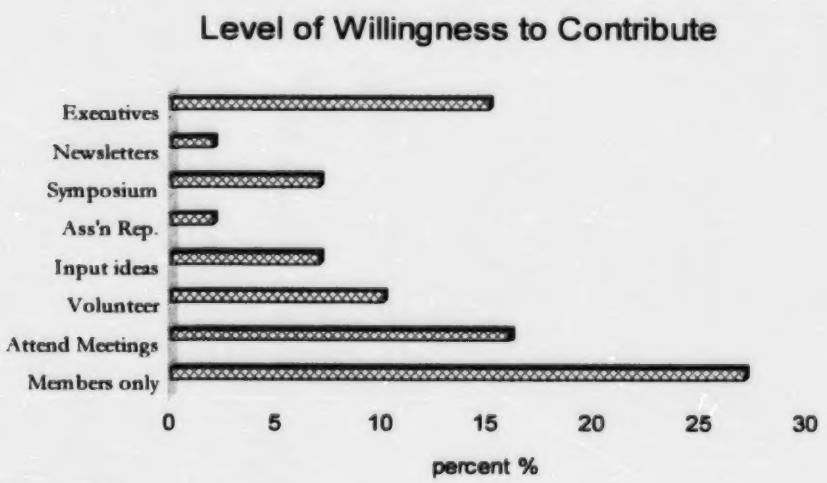


Chart 6 – OPA Survey Question 8 – In what ways would you be willing to contribute to the new OPA organization?



Ontario

Ontario Geological Survey
Regional Resident Geologist Program

Southern Ontario Regional Resident Geologist (Petroleum Resources Centre) – 2000

by

T.R. Carter and G.J. Spears

2001

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Oil and Gas Exploration and Development Activity in Ontario in 2000

T.R. Carter[1] and G.J. Spears[2]

[1] Subsurface Geologist, Petroleum Resources Centre, Ministry of Natural Resources, London

[2] Manager, Oil, Gas and Salt Resources Library

INTRODUCTION

Buoyed by elevated world oil prices and rising natural gas prices in North America, oil and gas drilling activity increased significantly throughout North America including Ontario. In the year 2000, there were a reported 109 wells drilled in Ontario. This is a greater than 50% increase over the 69 wells reported to be drilled in 1999. The early onset of a cold winter and short-term supply shortage concerns in 2000 appears to have spurred interest in drilling for natural gas in Ontario. The value of production set a record in 2000. Ontario producers received $65.6 million for oil produced in 2000, compared to $44 million the previous year. The value of the natural gas production is not yet available, but it is also expected to be a record.

EXPLORATION ACTIVITY

A total of 121 licences to drill and operate new wells were issued by the Ministry of Natural Resources in 2000, compared to 112 in 1999. At the time of writing, drilling was reported to be complete at 109 wells consisting of 42 exploratory wells, 56 development wells, and 11 in other classes ("service"). The 2000 exploratory drilling resulted in 11 wells reported as gas producers and 5 wells reported as oil producers (Table 1). An additional 2 wells encountered hydrocarbons and were undergoing evaluation at the time of writing. Development drilling resulted in 18 wells reported to be oil producers and 20 as gas producers, with 5 wells undergoing evaluation.

Drilling was reported to be complete at 11 exploratory wells and 19 development wells testing Ordovician targets in 1999. Four of the Ordovician exploratory wells were reported to be completed as oil producers and one as a gas producer. Two of these wells were new pool discoveries; Talisman #2 (Horiz. #1) Mersea 5-20-A, and Talisman (Horiz.#1) Tilbury West 2-4-IX. The Ordovician development drilling resulted in 14 new oil producers with an additional 3 wells undergoing further evaluation. All of these successful wells were horizontal wells.

Only one exploratory well was drilled to test Cambrian targets in 2000. CGC/Raider #83, Blandford 4-XIII was reported to have encountered a show of natural gas and was suspended pending evaluation. There were no Cambrian development wells drilled.

There were 20 exploratory tests of Silurian Guelph-Salina targets in 2000 of which six were completed as oil or gas wells. 748160 Ontario Inc.#1, Chatham 6-15-XII was completed as an oil producer in a new pool discovery. Petrofind #3, Moore 4-VII was a new pool gas discovery. Manti No.1 Sombra 7-A-XI was a new pool oil discovery. Range et al Moore 5-10-VIII was reported to be new pool gas discovery. Talisman (Horiz. #1) Lake Erie 221-F-1 was reported to be a potential gas producer in an

exploratory extension of the Morpeth gas pool. Range et al No.2 Sombra 8-27-XII was a successful new pool gas discovery. Four additional wells were undergoing evaluation at the time of writing. There were 16 development tests of Silurian Guelph-Salina targets in 2000. Nine of these wells were completed as gas producers and four were undergoing testing at the time of writing.

There were 4 exploratory and 12 development tests of Lower Silurian sandstone targets in 2000. All four exploratory wells were completed as gas producers in exploratory extensions of known gas fields in Gainsborough and South Walsingham townships. All 12 development wells were also completed as gas producers.

There were 9 development and 6 exploratory tests of Devonian targets in 2000. In exploratory drilling, Rubicon et al #7 Harwich 18-IV was reported to be a new pool gas discovery. Two other wells were undergoing further evaluation with 3 wells plugged and abandoned.

Eleven wells in other classes were drilled in 2000. Union Gas Limited drilled 8 natural gas storage wells in 2000. Six wells were completed in the newly designated Mandaumin gas storage pool, one in the Sarnia 5-3-II (Bluewater) storage pool, and one in the Oil City storage pool. These wells are used for injection and withdrawal of natural gas from the storage pools. General Chemical completed two salt solution mining wells in 2000 on their solution-mining site in the Amherstburg area, and Sifto Canada Inc. completed one salt solution mining well at their mining site in Goderich.

Preliminary figures indicate that Ontario produced 219 898 cubic metres of crude oil (1.5 million barrels) in 2000 valued at $65.6 million. This represents an 8 percent volume decrease from the previous year and nearly a 50 percent increase in value. In 1999, production totalled 239 915 cubic metres valued at $44 million.

Data on natural gas production in 2000 is not yet available, but there will have been a similar increase in value.

RECOMMENDATIONS FOR EXPLORATION

Ordovician reservoirs are still the focus of exploration directed at discovery of new oil reservoirs, with Essex County and southern Kent County being the most favourable areas for exploration. Near-shore lands beneath the waters of Lake Erie and Lake St Clair are also very attractive as continued improvements in horizontal drilling technology make these lands accessible from onshore locations. Horizontal drilling accounted for nearly all the wells drilled in the Ordovician play in 2000.

Gas plays in Ontario have become much more attractive with the dramatic increase in spot prices for natural gas in 2000. There still remains considerable untested potential in Lake Erie and parts of the onshore portions of Haldimand, Norfolk, and Welland counties. There is considerable potential for discovery of Cambrian gas or oil pools along the pinch-out edge of the Cambrian sandstone in the subsurface, or in fault-controlled structures. Silurian pinnacle and incipient reefs in Lambton County are also gas-prone and have the additional advantage of potential conversion to natural gas storage.

Some success was reported in the long-established Devonian play this year and in 1999. The core area for this play in Lambton County is fully developed. Areas with the best remaining potential are on the fringes of the play in southern Kent County, and western Elgin and Middlesex counties.

Table 1. Successful exploratory wells in southwestern Ontario in 2000 (see Figure 1 for well locations).

Map #	Latitude	Longitude	Well Name	Target	Depth (m)	Results	TD Date
1	42-33-59	82-14-15	748160 Ontario Inc.#10, Chatham 6-15-XII	SAL	505.5	OP/ACT	1/5/2000
2	42-42-45	80-28-33	Metalore #89, Walsingham N. 7-22-VII	CLI	404.2	GP/ACT	1/17/2000
3	42-50-11	82-15-49	Petrofind #3, Moore 7-4-VII	SAL	702.0	GP/SUS	1/17/2000
4	42-42-24	82-28-18	Manti No.1, Sombra 7-A-XI	SAL	738.0	GP/SUS	1/31/2000
5	42-42-56	82-16-03	Range et al No.2, Sombra 8-27-XII	SAL	663.7	GP/ACT	2/27/2000
6	42-02-53	82-33-55	Talisman (Horiz. # 2), Mersea 7-237-STR	ORD	2024.2	OP/ACT	4/4/2000
7	42-00-23	82-30-03	Talisman #2 (Horiz.#1), Mersea 5-20-A	ORD	2009.0	OP/ACT	6/10/2000
8	42-04-23	82-25-16	Talisman (Horiz.#1) West, Lake Erie 289-A-4	SAL	1020.8	GS/POT	7/5/2000
9	42-13-33	81-29-18	Talisman (Horiz.#1)West, Lake Erie 221-F-1	SAL	788.0	GP/POT	9/1/2000
10	43-00-04	79-31-12	Founder #26, Gainsborough 53-9-I	CLI	157.6	GP/ACT	9/19/2000
11	43-00-45	79-31-04	Founder #20, Gainsborough 2-10-I	CLI	169.8	GP/ACT	10/4/2000
12	42-39-25	79-43-55	Talisman ELE, Lake Erie 69-D-3	ORD	1270.0	GP/CAP	10/4/2000
13	42-19-31	82-04-13	Rubicon et al #7, Harwich 9-18-IV	DEV	122.5	GP/ACT	10/25/2000
14	42-51-14	82-18-22	Range et al Moore No. 1, Moore 5-10-VIII	SAL	740.0	GP/POT	11/8/2000
15	43-00-27	79-31-04	Founder #22, Gainsborough 6-10-I	CLI	184.2	GP/ACT	11/9/2000
16	42-00-28	82-31-23	Talisman (Horiz. #1), Mersea 8-17-B	ORD	2402.0	OS/POT	11/10/2000
17	42-12-16	82-34-30	Talisman (Horiz.#1), Tilbury West 2-4-IX	ORD	2690.0	OP/ACT	11/13/2000
18	42-04-29	82-34-51	Talisman No. 2 (Hor. #1), Mersea 1-241-NTR	ORD	2004.0	OP/ACT	11/28/2000

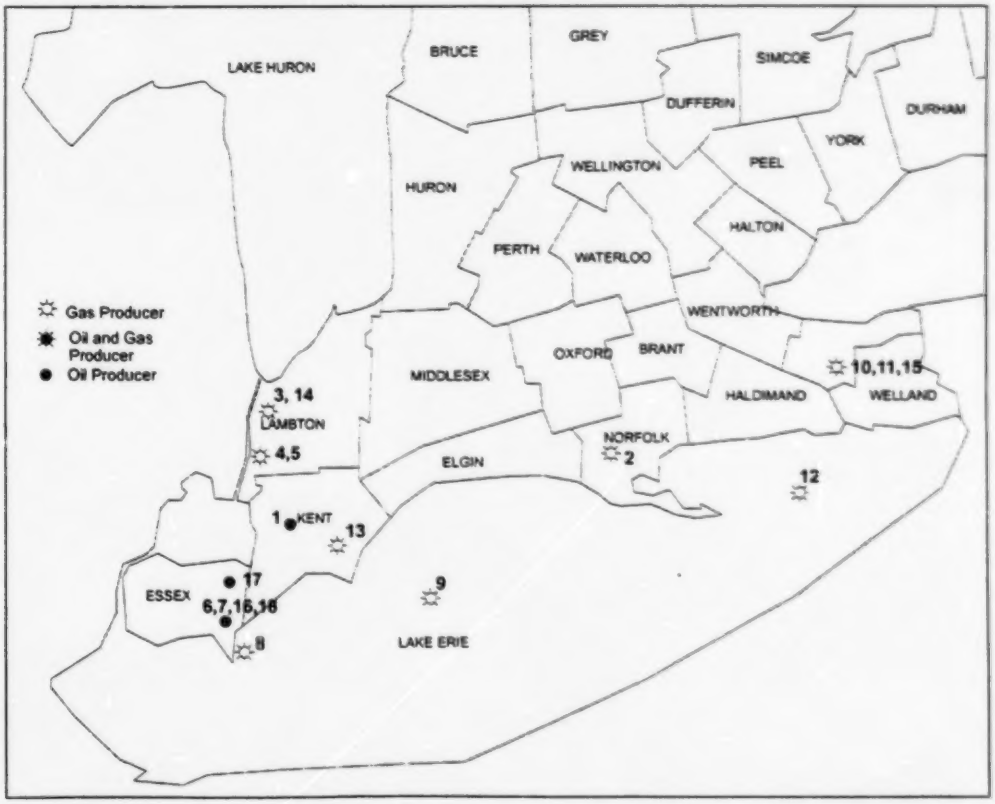

Figure 1. Successful exploratory wells in Ontario in 2000.

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Ontario

Ontario Geological Survey
Regional Resident Geologist Program

Southern Regional Land Use Geologist District – 2000

by

R. Debicki and D. Rowell

2001

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Regional Land Use Geologist – Southern

Ruth Debicki[1] and Dave Rowell[2]

[1] Land Use Policy and Planning Coordinator

[2] Regional Land Use Geologist - Southern

INTRODUCTION

Over the past several years, the Government of Ontario has re-engineered the way it delivers services to the people of Ontario. The changes that may be most familiar to the exploration community are the centralization of the Mining Recorders in the province and the posting of claim maps and claims information on the Ministry's website. At the same time, other changes have happened in other ministries throughout government. Some of them have had implications for the Resident Geologist Program.

As a result of these modifications, staff of the Resident Geologist Program have found themselves dealing with new clients in government, agencies, and non-governmental organizations, and delivering services that they had not delivered in past. These new services are important. Many of them relate to land use planning matters that are of interest to, or may directly affect, prospectors and developers. Many of them require knowledge and expertise that are outside the traditional knowledge and experience of professional geoscientists.

Some of these services relate to managing Crown land. They include working with the Ministry of Natural Resources to implement *Ontario's Living Legacy* which involves the establishment of 378 new parks or park expansions and conservation reserves across Ontario, and defining areas of "provincially significant mineral potential" within these new protected areas where mineral exploration will be allowed to proceed. They include administering work permits required for exploration activity in defined environmentally sensitive areas where natural heritage values need special protection, and ensuring that the mineral sector's interests are considered and accommodated in other land use planning initiatives such as forest management plans and the sale and transfer of Crown land.

Other services relate to municipal planning. They include working with Ministry of Municipal Affairs and Housing to review new municipal Official Plans, Official Plan Amendments, and consents (lot severances). Changes made to the *Planning Act* in 1996 recognize the interests of the mineral sector and the importance of protecting areas of high mineral potential from incompatible uses, and require that these considerations be factored into the municipal planning process. These considerations are important in the north where municipalities encompass huge tracts of land, including large areas of base and precious metals potential. They are also important in the south where industrial minerals are essential to the current, rapid expansion of existing communities and to the development of new ones.

In addition, there are emerging requirements for staff of the Resident Geologist Program to help ensure that access to the land base remains open to the exploration community, and to work with First Nations and the mineral sector to develop shared understanding of the other's rights, obligations, and interests in mineral exploration and development on Crown land.

These new and emerging needs were resulting in Resident Geologist Program staff having to divert their energies away from the traditional client services provided to the exploration and development

community to attend to land use planning matters. On average, about 20 per cent of staff time was being directed toward such work – although in Southern Ontario, land use planning consumed as much as 75 per cent of staff time. The end result was less time being available for delivering the level of traditional program services to which mineral industry clients had become accustomed.

To address these converging concerns, three new positions were created and the new "Regional Land Use Geologists" were hired in the autumn of 2000 to alleviate some of the pressures that impacted on the program. These new positions combine geoscience and mineral sector expertise with an understanding of land use legislation, regulations and issues.

Regional Land Use Geologists

Abraham Drost, the Regional Land Use Geologist based in Thunder Bay, is responsible for matters related to land use in the Red Lake, Kenora, Thunder Bay North and Thunder Bay South Resident Geologist districts. He has an M.Sc. degree in geology and a Certificate in Environmental Assessment, and has studied real estate law. Abraham has 16 years' experience in mineral exploration and development and was involved in the discovery of the past-producing Golden Patricia gold mine in northwestern Ontario. He has served on the executive of prospectors' organizations in Thunder Bay and Timmins.

Gord Yule, the Regional Land Use Geologist based in Timmins, is responsible for matters related to land use in the Timmins, Kirkland Lake, and Sault Ste. Marie Resident Geologist districts, plus those portions of the Sudbury Resident Geologist District north of the French River. He has a B.Sc. degree in geology, and 25 years' experience in mineral exploration, during which time he has been involved in the discovery of eight deposits in northeastern Ontario, including five past and present producers.

Dave Rowell, the Regional Land Use Geologist based in Sudbury, is responsible for those portions of the Sudbury Resident Geologist District south of the French River, including Manitoulin Island, plus the Southwestern Ontario and Southeastern Ontario Districts. Dave has an M.Sc. degree in Physical Geography, and 18 years' experience in mapping surficial geology and defining and managing aggregate and industrial mineral resources in the private sector and with the Government of Ontario.

The boundaries of the Regional Land Use Geologist Districts are shown on the map included in the preface to this report.

The result of these appointments, which mark the first significant increase in Resident Geologist Program staff in many years, will be twofold. There will be a reduction of the workload relating to land use issues for other Resident Geologist Program staff, allowing them to concentrate more fully on "traditional" services including:

- maintaining and providing access to assessment files, the drill core library system and other geoscience databases;
- providing information and expert advise on local geology and its mineral endowment;
- conducting client property visits and geology field trips; and
- monitoring exploration activity and generating new recommendations for exploration.

The Regional Land Use Geologists will focus their attention on "emerging" services including:

- providing mineral-related information in support of Crown land planning;

- protecting mineral resources and operations from "sterilization", and people and property from mining and natural hazards during municipal planning; and
- helping explorationists and First Nations understand each other's interests, activities and obligations in mineral exploration and development.

The Resident Geologist Program has created these new staff positions to ensure that knowledgeable service is provided regarding these and other land use issues, since finding solutions to these matters is vital to the health and sustainability of the mineral sector. Liaison with and input from mineral sector representatives, including local prospectors and their associations, will form an essential contribution to the successful delivery of land use planning services that support mineral exploration and development.

REGIONAL LAND USE GEOLOGIST ACTIVITIES

Crown Land Planning

The Ministry of Natural Resources manages Crown land in Ontario through the *Public Lands Act*, the *Parks Act*, the *Aggregate Resources Act*, the *Crown Forest Sustainability Act*, the *Conservation Authorities Act*, the *Oil, Gas and Salt Resources Act*, and other acts. The Ministry of Northern Development and Mines also contributes to Crown land management in the province through the *Mining Act*.

The Regional Land Use Geologists are working closely with the Ministry of Natural Resources and their partners in several key areas. They are helping implement the *Ontario's Living Legacy* land use strategy by assisting in the regulation process for the new parks and conservation reserves, and in the development and application of criteria to allow "controlled exploration" in areas within those protected sites where there is provincially significant mineral potential.

They are helping to develop guidelines for the nine "Signature Sites" identified through the *Ontario's Living Legacy* land use strategy; reviewing management plans for both existing and new protected areas; and contributing to other land use planning and policy matters such as the Niagara Escarpment Plan.

The Regional Land Use Geologists are also working to help the mineral exploration and development community understand the forest management planning process, and to know how and when prospectors and developers should participate to ensure that their interests are considered. Forest management plans set the framework for activities in forest units for twenty-year spans, and establish the schedule and locations for access routes during that time. In addition, the Regional Land Use Geologists are working with the Ministry of Natural Resources to establish strategies for allowing the mineral sector to continue to access existing forest access roads.

Development on Private Land

The Ministry of Municipal Affairs and Housing manages planning on private land in Ontario through the *Planning Act*, the *Municipal Act*, and other legislation. Through their one-window approach, MNDM contributes to municipal planning by providing mineral-related technical information regarding private land to municipal governments, provides advice on planning matters that may affect mineral exploration and development, and comments on areas of mineral potential or mining-related hazards.

In conjunction with other program staff, the Regional Land Use Geologists review and comment on draft municipal Official Plans and Official Plan Amendments along with other planning matters including subdivision plans and consents (lot severances) where the approval authority lies with the Province of Ontario. They also provide training sessions and reference materials to representatives of the Ministry of Municipal Affairs and Housing and to municipal planners representing communities across the province. In addition, they may be called upon to serve as "expert witnesses" in cases where planning decisions are being reviewed by the Ontario Municipal Board or other tribunals.

First Nation Interests

First Nation communities across Ontario are looking for new economic opportunities. As well, they are asserting their Aboriginal rights and claiming higher levels of involvement and control concerning economic activity on Crown land within their traditional areas. As a result of a lack of clarity regarding Aboriginal rights on one hand, and some First Nations' lack of familiarity with the "mining sequence" on the other, conflicts have arisen between some explorationists and developers and certain First Nations.

The Regional Land Use Geologists are working with the mineral sector and with representatives of other government ministries and First Nation communities to establish mutual understanding of the actions, implications, and obligations of mineral exploration and development workers, and to facilitate their activities on traditional lands. This work includes sharing information concerning Aboriginal rights and the related obligations of the mineral sector, and discussing the stages of the mining sequence and resulting business opportunities with First Nation community members. The Regional Land Use Geologists are also helping resolve certain land claims in their respective areas.

REGIONAL DISTINCTIONS

It is worthwhile to note that there are significant differences between the critical land-use planning concerns in different parts of Ontario. Northwestern Ontario can be considered the province's "exploration frontier" while northeastern Ontario is an area of more mature exploration and established mining. Southern Ontario is more populated and mineral sector interests are concentrated on a growing industrial mineral and aggregate industry. Each region has its distinct assemblage of planning-related issues.

Northwestern Ontario, the province's "exploration frontier", is characterized by large tracts of open Crown land. Forest management and logging activities are regionally important and First Nation communities throughout the region are expressing their interest in Aboriginal rights. The area has limited infrastructure and access to remote areas, and is considered under-represented in terms of protected areas.

Northeastern Ontario has a high density of mining land tenure and numerous producing and past-producing mines. Forest management and logging activities are also regionally important and there are local to widespread Aboriginal issues. The area is also considered to be under-represented in terms of protected areas, but has more urbanization, infrastructure and private land holdings than northwestern Ontario, making it more difficult to identify unencumbered lands that may be set aside to protect and preserve natural heritage values.

Southern Ontario is an area with much higher population density and a relatively small amount of Crown land, and a greater focus on a growing industrial mineral and aggregate industry. There is major urbanization and well-developed infrastructure, however the high population density leads to greater opposition to many mineral-related activities and developments.

SOUTHERN ONTARIO ACTIVITIES

Introduction

There are at least 12 major provincial legislative acts, with accompanying regulations, guidelines and policies developed by several provincial ministries that relate to land use in Ontario. Some apply to Crown land while others apply to private land. The Regional Land Use Geologist combines geoscientific, mineral exploration and development expertise with an understanding of provincial legislation, regulations, policies and land use issues in order to optimize Ontario's land base for sustainable, safe and environmentally responsible mineral resource development.

The Southern Regional Land Use Geologist coordinates this mandate with other provincial ministries, municipalities, land-use interest groups and First Nations in the south to address matters including implementing the *Ontario's Living Legacy* land use strategy, monitoring development on private land, and preparing forest management plans.

Ontario's Living Legacy Land Use Strategy

The *Ontario's Living Legacy* (OLL) land use strategy is the province's Crown land management initiative to provide representative protected areas within a defined expanse of the province referred to as the "area of the undertaking" (i.e. principally all of the shield area south of latitude 51 degrees). Another principal tenet of the OLL land use strategy is to strengthen the economic health of the area.

The *Ontario's Living Legacy* strategy identified a total of 378 new provincial parks or park expansions and conservation reserves in the province. Thirty-one *Ontario's Living Legacy* sites are scheduled for regulation in the Southern Regional Land Use Geologist's area by the end of March 2001. Final boundaries of these new parks and conservation reserves have been reviewed, and access to mining interests within the sites and water crossings in waterway parks were discussed with the Ministry of Natural Resources, the lead ministry responsible for the site regulation process.

Public comments and questions surrounding other *Ontario's Living Legacy* sites, including sites that adjoin or encircle mining land tenure were monitored, as were public consultations concerning possible management options for the Great Lakes Heritage Coast Signature Site.

The *Ontario's Living Legacy* land use strategy allows for controlled mineral exploration in specified areas within new parks and conservation reserves identified as having "provincially significant mineral potential" (PSMP). If a mineral discovery is made in such an area and the site develops into an advanced exploration project or a new mine, the area of the discovery or proposed disturbance will be de-regulated and an appropriate, alternative area of equal size and natural heritage value will be regulated as protected area. Upon site rehabilitation at the completion of the exploration/mining activity the deregulated land will be returned to park status.

The Regional Land Use Geologists have contributed to a committee of industry and government representatives assembled to define the criteria for "provincially significant mineral potential" and a process for ranking the potential of areas of interest. In southern Ontario, the Regional Land Use Geologist focused on developing prototype maps for sand and gravel deposits, bedrock aggregate and industrial minerals. At the time of writing, the process for defining PSMP is currently close to

completion. It is envisioned that this mineral potential evaluation process will be incorporated into future land use planning activities and initiatives for both Crown and private lands in the province.

Forest Management Plans

There are 63 Sustainable Forest License (SFL) areas throughout the province. Each SFL area requires a Forest Management Plan to guide all harvesting activities within the subject Crown forests. Forestry operations include forest access road construction, maintenance and abandonment; stream crossings; timber harvesting and silvicultural practices. The plan must have regard for all other resource values as well as social (cultural, heritage, and tourism) and ecological (fish, wildlife, environmental) values.

Forest Management Plans and access roads became an important issue in the latter part of 2000 when explorationists found that access routes they had traditionally used to reach remote areas would eventually be closed. In southern Ontario, five Forest Management Plans that entered into the final phase of the approval process are scheduled to be in effect starting on April 1, 2001. In conjunction with colleagues, the Southern Regional Land Use Geologist is working to promote mineral resource values to Forest Management Plan authors and to highlight the opportunities available to the mining community through the Forest Management Plan development process.

Development on Private Land

Development on private land is largely subject to the control of the Ministry of Municipal Affairs and Housing (MMAH). The Southern Regional Land Use Geologist works closely with MMAH to ensure that the clauses in the Provincial Policy Statement of the *Planning Act* relating to mineral resources, mineral extraction, and mining-related hazards are given due consideration when planning decisions are made.

Eleven Official Plan documents, predominantly in the District of Parry Sound, were reviewed. Draft zoning by-laws for five areas were also reviewed for their influence on mineral exploration and development opportunities and activities. The Southern Regional Land Use Geologist is also assisting MMAH in their review of the effectiveness of the five-year-old Provincial Policy Statement to ensure that municipalities are making better planning decisions.

Prior to municipal elections during the fall, a presentation was made to the Township of South Bruce Council in support to a building stone quarry operator's plans to expand operations in the Eramosa Member of the Amabel Formation.

The Niagara Escarpment Commission (NEC) requested MNDM to assist in defining the brow and toe of the escarpment in the Parkway Belt West area in order for it to make the proper land designations within this parcel of land. The subject land in the Parkway Belt West area was promised to the NEC in the late 1970s and the province is currently in the process of completing this land transfer. Background research and fieldwork were completed and a final report was submitted to the Commission.

The Niagara Escarpment Commission is also beginning the legislated five-year review process of its mandate. The Southern Regional Land Use Geologist commented on the Terms of Reference for the review, which have since been accepted, and will be reviewing all six of the subject areas that will be pursued during the review.

Metric Conversion Table

Conversion from SI to Imperial			Conversion from Imperial to SI		
SI Unit	*Multiplied by*	*Gives*	*Imperial Unit*	*Multiplied by*	*Gives*
		LENGTH			
1 mm	0.039 37	inches	1 inch	**25.4**	mm
1 cm	0.393 70	inches	1 inch	**2.54**	cm
1 m	3.280 84	feet	1 foot	**0.304 8**	m
1 m	0.049 709	chains	1 chain	20.116 8	m
1 km	0.621 371	miles (statute)	1 mile (statute)	**1.609 344**	km
		AREA			
1 cm^2	0.155 0	square inches	1 square inch	**6.451 6**	cm^2
1 m^2	10.763 9	square feet	1 square foot	**0.092 903 04**	m^2
1 km^2	0.386 10	square miles	1 square mile	2.589 988	km^2
1 ha	2.471 054	acres	1 acre	0.404 685 6	ha
		VOLUME			
1 cm^3	0.061 023	cubic inches	1 cubic inch	**16.387 064**	cm^3
1 m^3	35.314 7	cubic feet	1 cubic foot	0.028 316 85	m^3
1 m^3	1.307 951	cubic yards	1 cubic yard	0.764 554 86	m^3
		CAPACITY			
1 L	1.759 755	pints	1 pint	0.568 261	L
1 L	0.879 877	quarts	1 quart	1.136 522	L
1 L	0.219 969	gallons	1 gallon	**4.546 090**	L
		MASS			
1 g	0.035 273 962	ounces (avdp)	1 ounce (avdp)	28.349 523	g
1 g	0.032 150 747	ounces (troy)	1 ounce (troy)	**31.103 476 8**	g
1 kg	2.204 622 6	pounds (avdp)	1 pound (avdp)	**0.453 592 37**	kg
1 kg	0.001 102 3	tons (short)	1 ton (short)	**907.184 74**	kg
1 t	1.102 311 3	tons (short)	1 ton (short)	**0.907 184 74**	t
1 kg	0.000 984 21	tons (long)	1 ton (long)	**1016.046 908 8**	kg
1 t	0.984 206 5	tons (long)	1 ton (long)	**1.016 046 90**	t
		CONCENTRATION			
1 g/t	0.029 166 6	ounce (troy)/ ton (short)	1 ounce (troy)/ ton (short)	34.285 714 2	g/t
1 g/t	0.583 333 33	pennyweights/ ton (short)	1 pennyweight/ ton (short)	1.714 285 7	g/t

OTHER USEFUL CONVERSION FACTORS

	Multiplied by	
1 ounce (troy) per ton (short)	31.103 477	grams per ton (short)
1 gram per ton (short)	0.032 151	ounces (troy) per ton (short)
1 ounce (troy) per ton (short)	20.0	pennyweights per ton (short)
1 pennyweight per ton (short)	0.05	ounces (troy) per ton (short)

Note: Conversion factors which are in bold type are exact. The conversion factors have been taken from or have been derived from factors given in the Metric Practice Guide for the Canadian Mining and Metallurgical Industries, published by the Mining Association of Canada in co-operation with the Coal Association of Canada.

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